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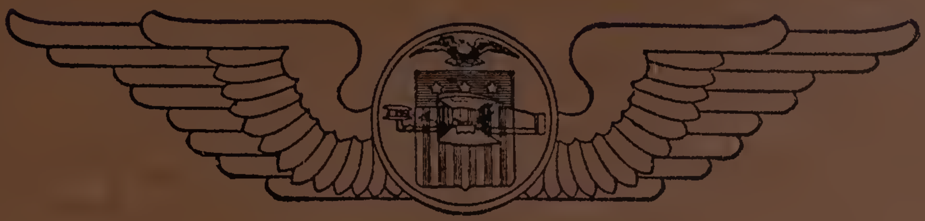

Digest of Civil Air Regulations for Pilots

Civil Aeronautics Bulletin No. 22

SEVENTH EDITION, OCTOBER 1943

UNITED STATES DEPARTMENT OF COMMERCE
U.S. CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON, D. C.

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PREFACE

The purpose of this publication is to explain to the student pilot in as nonlegal phraseology as practicable those provisions of the Civil Air Regulations which most directly affect the pilot. Although designed primarily for use as a textbook in the CAA War Training Service, this book is valuable to anyone preparing for the examination on the Civil Air Regulations required for issuance of a pilot's certificate.

This digest is based on the regulations in effect on June 1, 1943. Aeronautics is a constantly developing science, and new knowledge gained through research and experience necessitates frequent revisions and changes in the regulations pertaining to it. Such revisions and changes are covered by amendments to the regulations which are issued when necessary. Notification of amendments to Civil Air Regulations is carried in the monthly CIVIL AERONAUTICS JOURNAL, obtainable from the Superintendent of Documents, Washington, D. C., on subscription at $0.50 per year.

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INTRODUCTION

THE GOVERNMENT IN CIVIL AVIATION

Since 1926 the United States Government, through special Congressional "acts," has recognized the importance of aviation as a national activity. Exactly one year before Lindbergh took off for Paris, the first of these, the Air Commerce Act, approved May 20, 1926, provided for the promotion and regulation of civil aeronautics.

The act did not create a new bureau in the Department of Commerce to perform these functions. The task of establishing, maintaining, and operating aids to navigation along air routes was assigned to the Lighthouse Service; the mapping of air routes to the Coast and Geodetic Survey; and research for the improvement of air navigation aids to the Bureau of Standards. Two special divisions were established to examine and license aircraft and airmen and enforce air traffic rules, and to collect and disseminate aeronautical information. Collectively, this arrangement was referred to as the Aeronautics Branch of the Department of Commerce.

One year after Wiley Post made his first round-the-world flight, a "Bureau of Air Commerce" was born, the first separate Federal Government organization devoted exclusively to the management of civil aviation. On July 1, 1934, the functions of the rather loosely organized Aeronautics Branch were combined into a single bureau of the Department.

A year before the start of the first civilian pilot training program, the Civil Aeronautics Act of 1938 abolished the Bureau of Air Commerce in favor of a "Civil Aeronautics Authority." The Authority was an independent agency composed of a five-member "authority," an administrator, and a three-member "Air Safety Board." The five-man group was broadly responsible for economic and safety regulation and registration of aircraft. The administrator was responsible for the establishment, maintenance, and operation of the civil airways and for carrying out certain developmental work on aeronautical equipment. The safety board investigated aircraft accidents and recommended safety programs to the Authority.

The first successful helicopter was undergoing final development tests, when on June 30, 1940, reorganization plans effected by the President and passed by Congress resulted in the complete separation of the five-member "authority" and the administrator. The five-man group became the Civil Aeronautics Board. The safety board was abolished and its duties assigned to a safety bureau within the new Civil Aeronautics Board. Since the above date the Board has performed adjudicative, rule-making, and accident investigating functions as an independent agency. The administrator and his staff are now known as the Civil Aeronautics Administration and the Administration is part of the Department of Commerce.

The Aeronautics Branch, the Bureau of Air Commerce, the Authority, and now the Board and the Administration have developed air regulations to increase safety. The end result of these organizations' efforts, the Civil Air Regulations, inasmuch as they pertain to pilots, have been digested in this book.

This compact digest, because of its brevity, cannot serve as a legal reference to existing Federal air regulations, but it is not intended as such. Rather, this edition has been prepared to give the developing airman a concise hand-book which will serve as an unfailing guide to the best tested and approved flight practices. While these regulations may be considered "laws" by lawyers, to pilots they are merely safety tips with teeth in them. Pilots who follow them will have log books full of happy flying hours.

METHODS BY WHICH SAFETY IS INCREASED

Much of the safety work of the Board and Administration is not regulatory in nature. In cooperation with other agencies, such as the military services, the Weather Bureau, the National Advisory Committee for Aeronautics, the Coast and Geodetic Survey, and the manufacturers of aircraft and the airline transport companies, they maintain services and develop new equipment and methods which are directed toward increasing safety. Maps are published which give essential information to pilots. The network of "civil airways," called the Federal Airways System, is maintained by the Administration. Communications systems along these airways are maintained by the Administration and others in close cooperation with the Administration, for furnishing information regarding weather conditions, traffic and such to pilots during flight and to airports and other points on the ground.

The Civil Aeronautics Board investigates accidents to aircraft and discovers the cause wherever possible. These investigations furnish material for bulletins which are sent to airports for posting on the bulletin board so that pilots may learn or be reminded of things to be avoided. The CIVIL AERONAUTICS JOURNAL, published monthly, carries information directly related to safety.

Beginning in the late winter of 1938–39 with a few hundred student pilots, and continuing with an enlarged program in the fall of 1939, the Civilian Pilot Training Program was developed for the primary purpose of training a large number of pilots under conditions so controlled as to insure a maximum of safety, both during the training period and thereafter.

Since the entire program is now devoted to the training of pilots and instructors for the Army and Navy, the name, Civilian Pilot Training, did not express the true purpose of the program, and was changed accordingly to CAA War Training Service in the latter part of 1942.

REGULATIONS FOR SAFETY

One of the duties assigned to the Board by the Civil Aeronautics Act is that of making regulations which promote safety. These regulations cover a wide range of things related to aviation, but may be grouped under four heads:

(*a*) those concerned with the competency of the pilot;

(*b*) those concerned with the airworthiness of the aircraft;

(*c*) those concerned with the control of air traffic so that the flight of aircraft may experience a minimum of delay and hazard due to the presence of other aircraft, and

(*d*) those directed toward the elimination of undesirable flying practices.

The Civil Air Regulations (CAR) are the result of study of the combined experience of many pilots and others who have worked with aircraft. Compliance with the regulations is not only required by law, but is necessary in the development of safe flying habits.

INDEX OF AIR REGULATIONS

In this digest, only those regulations have been included which are of particular interest to pilots in contact and instrument flight. For the use of persons who may wish to refer to the regulations themselves, the complete index is given below:

Civil Air Regulations

Part 01.—Airworthiness Certificates.
Part 02.—Type and Production Certificates.
Part 04.—Airplane Airworthiness.
Part 13.—Aircraft Engine Airworthiness.
Part 14.—Aircraft Propeller Airworthiness.
Part 15.—Aircraft Equipment Airworthiness.
Part 16.—Aircraft Radio Equipment Airworthiness.
Part 18.—Maintenance, Repair, and Alteration of Certified Aircraft and of Aircraft Engines, Propellers, and Instruments.
Part 20.—Pilot Certificates.
Part 21.—Airline Transport Pilot Rating.
Part 22.—Lighter-Than-Air Pilot Certificates.
Part 24. —Mechanic Certificates.
Part 25.—Parachute Technician Certificates.
Part 26.—Air-Traffic-Control-Tower Operator Certificates.
Part 27.—Aircraft Dispatcher Certificates.
Part 29.—Physical Standards for Airmen.
Part 40.—Air Carrier Operating Certification (Interstate).
Part 50.—Flying School Rating.
Part 51.—Ground Instructor Rating.
Part 52.—Repair Station Rating.
Part 53. —Mechanic School Rating.
Part 54.—Parachute Loft Certificates and Ratings.
Part 60.—Air Traffic Rules.
Part 61.—Scheduled Air Carrier Rules (Interstate).
Part 66.—Foreign Air Carrier Regulations.
Part 97.—Rules of Practice Governing Suspension and Revocation Proceedings.
Part 98.—Definitions.
Part 99.—Mode of Citation of Regulations.

Regulations of the Administrator

Part 501.—Aircraft Registration Certificates.
Part 503.—Recordation of Aircraft Ownership.
Part 510.—General Regulations, Washington National Airport.
Part 511.—General Aeronautical Rules for the Washington National Airport.
Part 525.—Notice of Construction or Alteration of Structures On or Near Civil Airways.
Part 531.—Seizure of Aircraft.
Part 532.—Reproduction and Dissemination of Current Examination Materials.
Part 600.—Designation of Civil Airways.
Part 601.—Designation of Airway Traffic Control Areas, etc.

Most of the rules given in this book are taken from Part 20 and Part 60. When reference is made to any of the regulations proper, it is essential to take into account the system of numbering the sections if a clear understanding is to be obtained. For example, in Part 60 there is a subdivision 60.4 which is headed "Flight Rules (Contact)" and another, 60.5, headed "Flight Rules

(Instrument)." Smaller subdivisions are indicated by one or more additional digits. For example, regulation 60.43 states "A flight plan is not required unless the flight is made at night and lies within or passes through airway traffic control areas." Although no words to that effect are included in the immediate context of the section, the first three numbers indicate that this regulation applies to contact flight. Similarly, regulation 60.53 gives the requirement with regard to a flight plan for instrument flight, although the words "instrument flight" do not occur in the statement of this particular regulation. Similarly, in reading regulation 60.532, it must be remembered that the heading 60.5 and subheading 60.53 are part of the statement in 60.532.

Where the Civil Air Regulations are referred to in this digest, the number of the particular regulation is carried in parentheses immediately following.

SUGGESTIONS FOR STUDY

In studying the regulations in this digest, it will be noted that with respect to the pilot's use of them there are two kinds.

1. Some of the regulations, for example those that deal with the issuance of pilot certificates and the registration of airplanes, are needed only at stated times. In the case of such regulations, it is ordinarily sufficient for the pilot to have a general knowledge of their contents and to know when to consult the regulations for details.

2. Others of the regulations, for example those that deal with the maintenance of the airplane and its management in flight, must be so thoroughly learned that the pilot observes them automatically. In the case of such regulations, detailed and specific knowledge is necessary.

The questions at the end of each chapter have been framed so as to indicate the kind of detail the pilot will probably need to know for contact and instrument flight. They are not, however, to be interpreted as covering everything that he should know.

Review Exercise

1. Study a copy of the Civil Aeronautics Journal and list the items that have a bearing upon safety and explain briefly in what way they are related to safety.

Chapter I.—FLIGHT RULES

RUNNING OF ENGINES

No aircraft engine shall be started or run unless a competent operator is in the aircraft attending the engine controls. Blocks, equipped with ropes or other suitable means of pulling them, shall be placed in front of the wheels before starting the engine, or engines, unless the aircraft is provided with adequate parking brakes which are fully on (60.331).

TAKE-OFFS AND LANDINGS

The following rules shall govern the method by which aircraft shall take off and land:

(*a*) A take-off shall not be commenced until there is no risk of collision with other aircraft during such take-off (60.3300).

(*b*) Aircraft approaching for a landing shall circle the airport or other landing area sufficiently to observe other traffic, unless the pilot receives other instructions from the air-traffic control-tower operator. All circles, either approaching for a landing or after take-off, shall be made to the **left** unless the pilot receives other instructions from the air-traffic control-tower operator, or unless the Administrator has prescribed, in the interests of safety, a different procedure for the particular airport or landing area (60.3301).

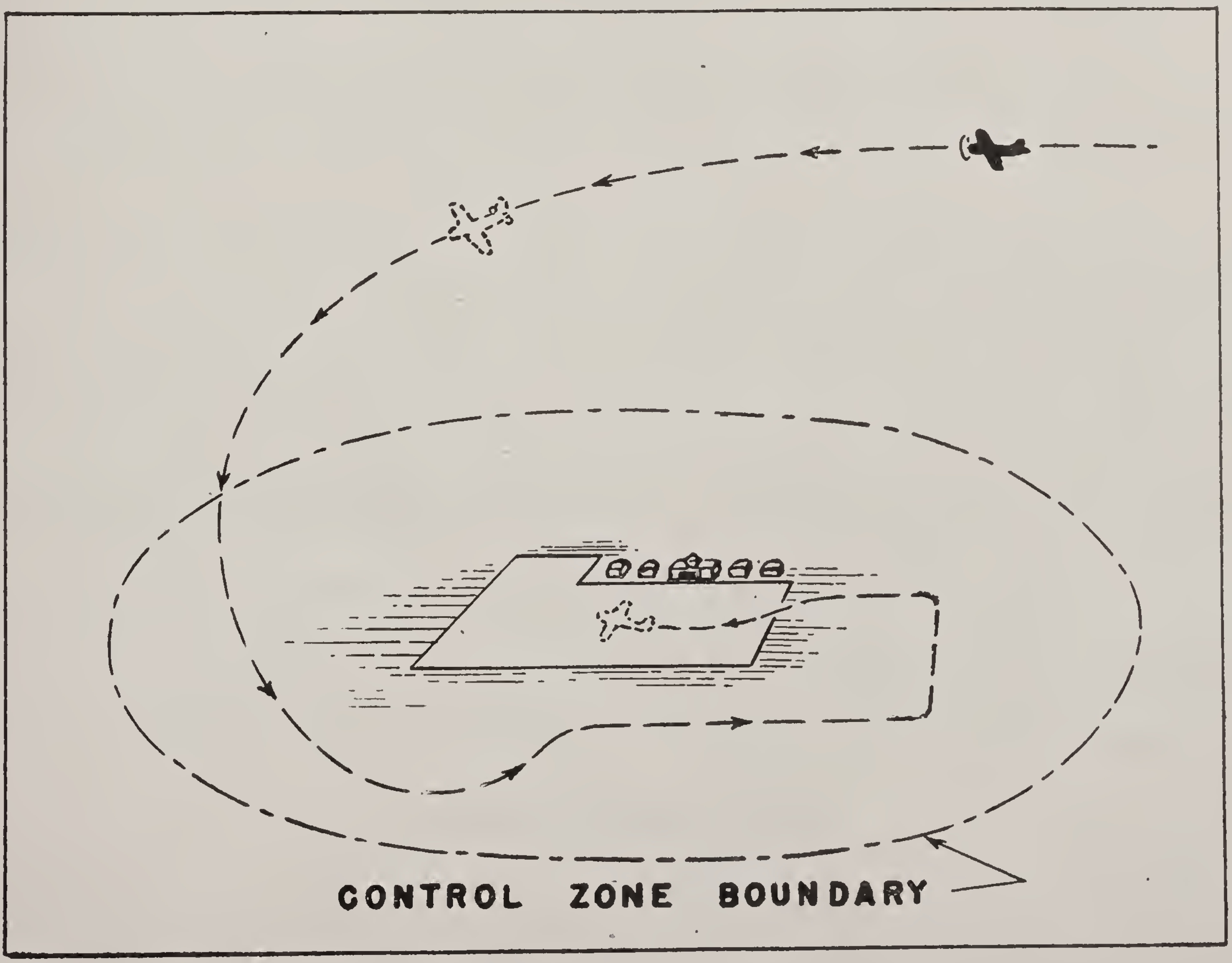


Figure 1.—Traffic Circle.

(*c*) Aircraft approaching for a landing shall, unless impracticable, maintain a straight approach course for the last **1,000 feet** before crossing the airport boundary.

(*d*) Aircraft making contact flights within 3 miles horizontally of the center of an airport or other landing area shall conform to the circle rule provided in (*b*) unless flying at an altitude in excess of 1,500 feet above such airport or other landing area.

(*e*) Air traffic departing from or arriving at a control airport shall take precedence over other air traffic within the control zone of such airport when required in the interests of safety.

RIGHT-OF-WAY

The following rules will govern aircraft right-of-way:

(*a*) *Order.*—Aircraft in flight shall have right-of-way in the following order: (1) Balloons, fixed or free (an airship not under control is classed as a free balloon); (2) gliders; (3) airships, and (4) airplanes (including rotor-planes).

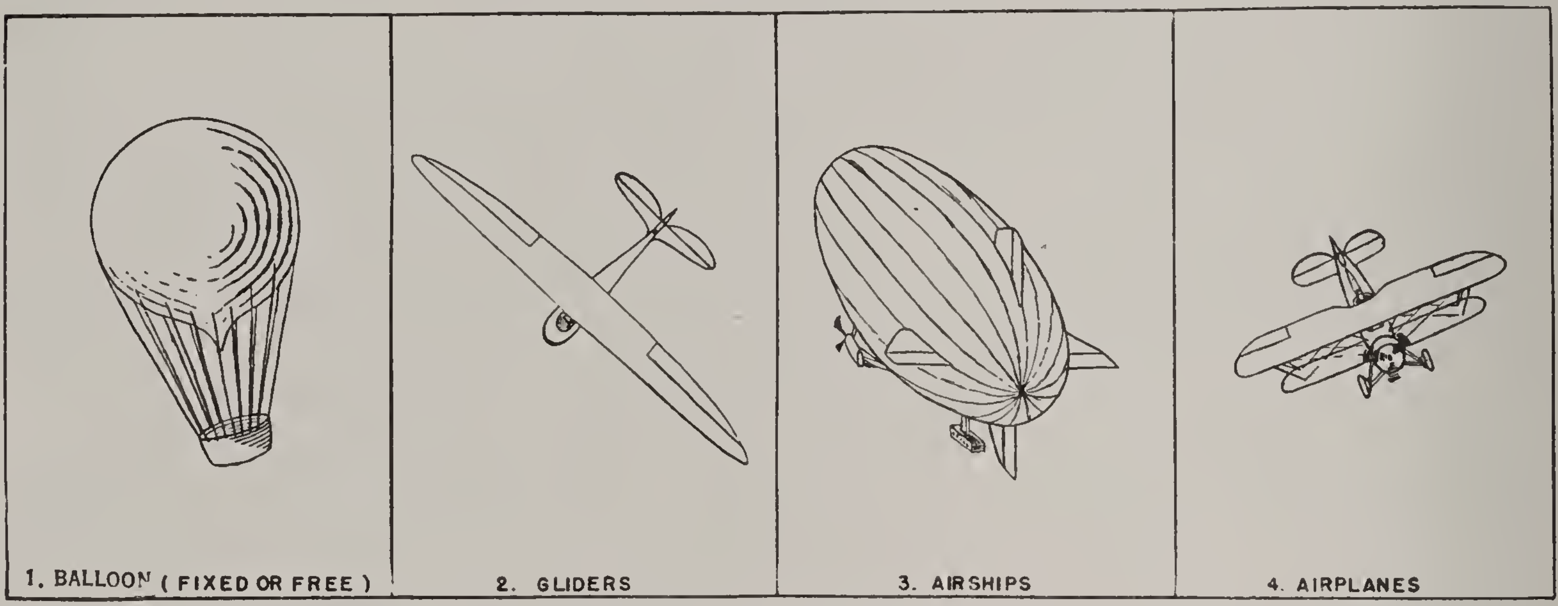


Figure 2.—Order of right-of-way.

(*b*) *Crossing.*—When two aircraft are on crossing courses at approximately the same altitude, the **aircraft which has the other on its left shall have the right-of-way,** and the other aircraft shall give way.

(*c*) *Approaching head-on.*—When two aircraft are approaching head-on, or approximately so, and there is danger of collision, each shall alter its course to the **right** so that they will pass each other at a distance of at least **500 feet.**

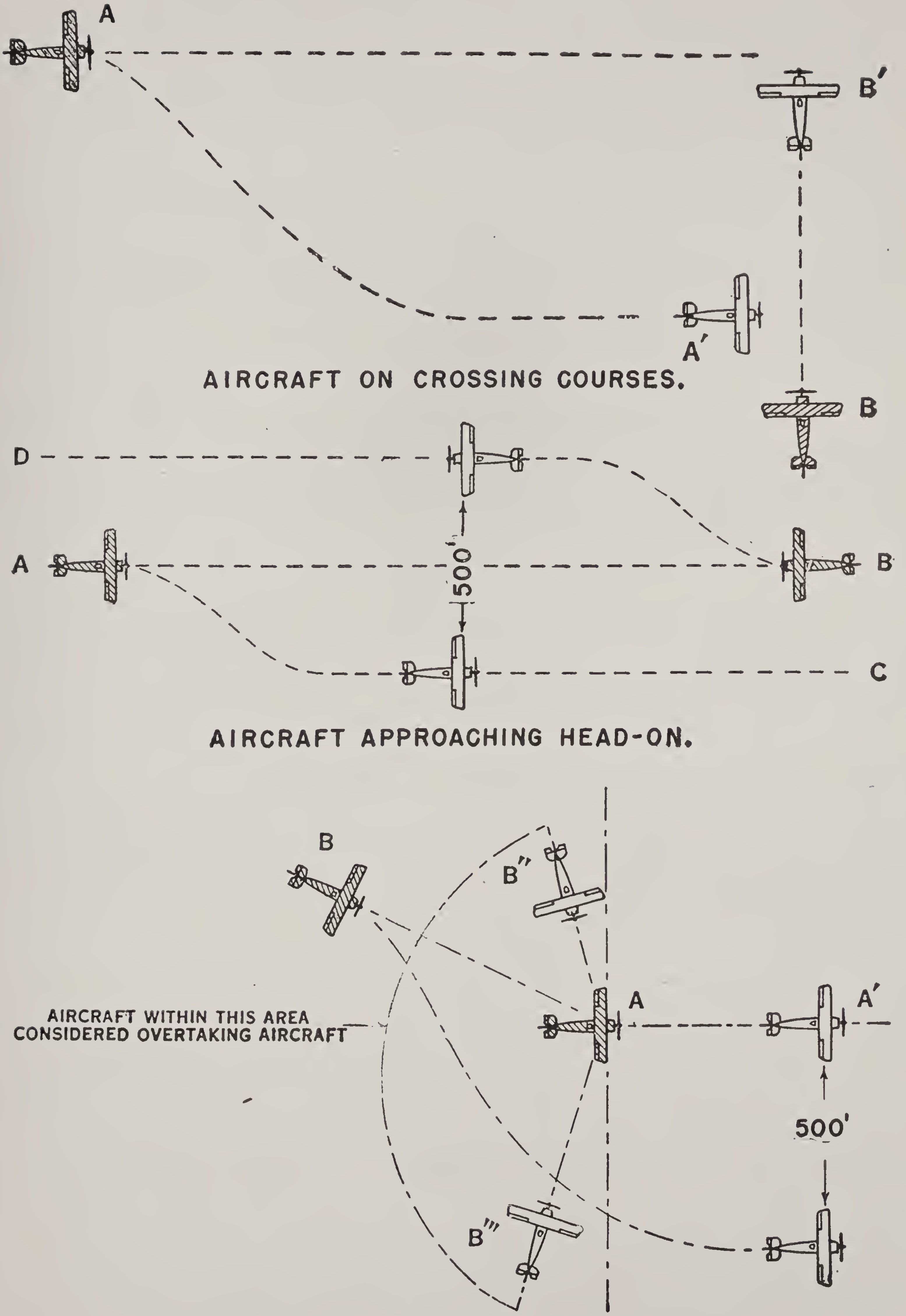
(*d*) *Overtaking.*—An overtaken aircraft shall have right-of-way and the overtaking aircraft shall keep clear of the overtaken aircraft by altering its own course to the **right.**

(*e*) *Landing.*—An aircraft landing in the manner prescribed shall have right-of-way over other aircraft in flight or on the ground or water, except aircraft landing in distress.

(*f*) *Distress landing.*—An aircraft in distress shall have right-of-way in attempting to land (60.340).

RIGHT-SIDE TRAFFIC

Aircraft operating along a civil airway shall keep to the right of the radio range course projected along the airway, or if no radio range course is projected along the airway, shall keep to the right of the center line of the airway except:



AIRCRAFT ON CROSSING COURSES.

AIRCRAFT APPROACHING HEAD-ON.

OVERTAKING AIRCRAFT.

Figure 3.—Right-of-way.

(*a*) when impracticable for reasons of safety;

(*b*) when otherwise instructed or authorized by an airway traffic control center of the Administrator;

(*c*) in the case of inbound aircraft operating on instruments and using the on-course signal of the radio range;

(*d*) when landing or taking off (60.342).

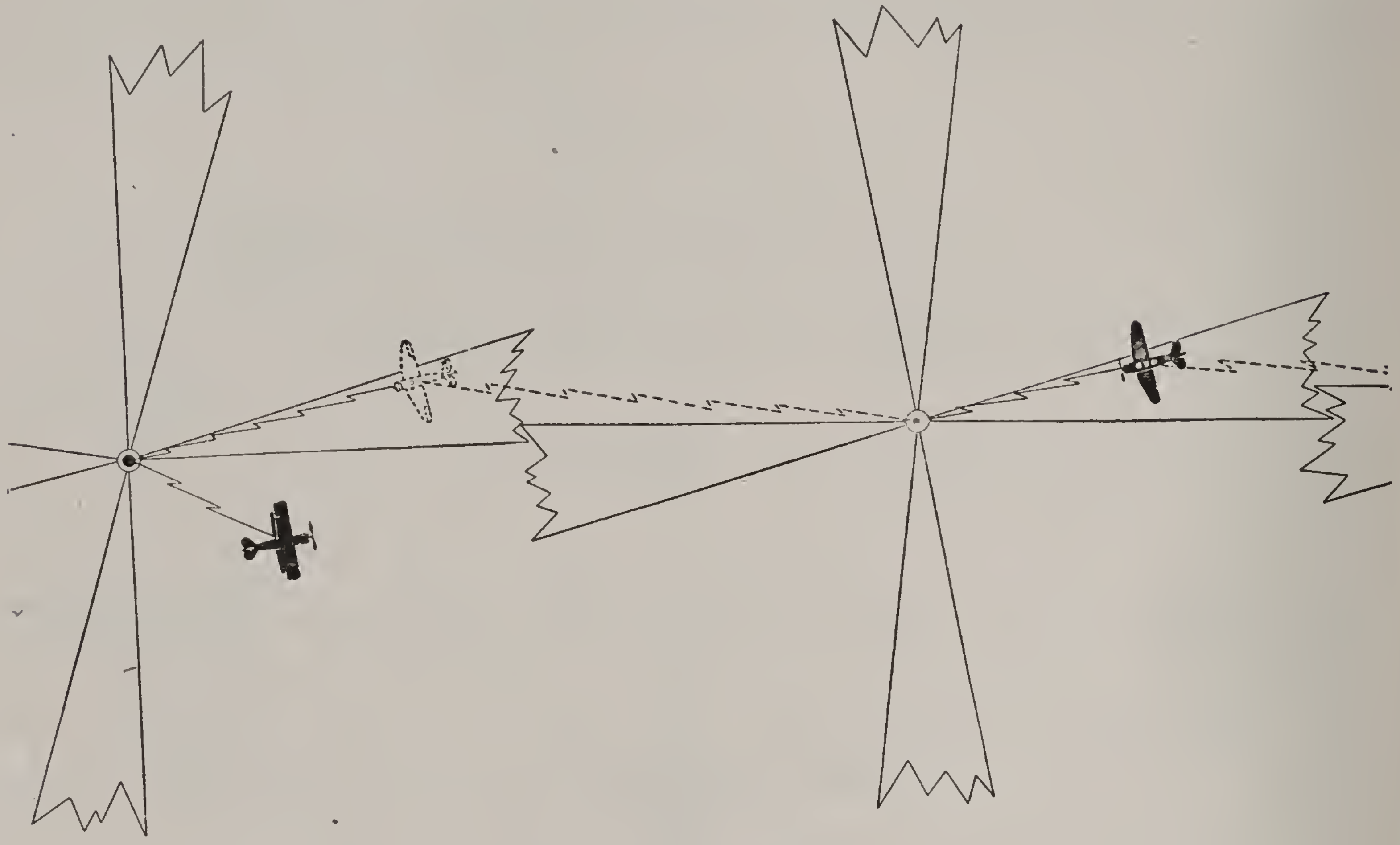


Figure 4.—Right-side traffic.

PROXIMITY IN FLIGHT

No aircraft shall be flown closer than 500 feet to any other aircraft in flight, except that by prearrangement two or more aircraft may be flown in formation closer than 500 feet to each other. When such flight is to be made within the limits of an airway traffic control area, a flight plan shall be filed in accordance with the prescribed rules (60.343).

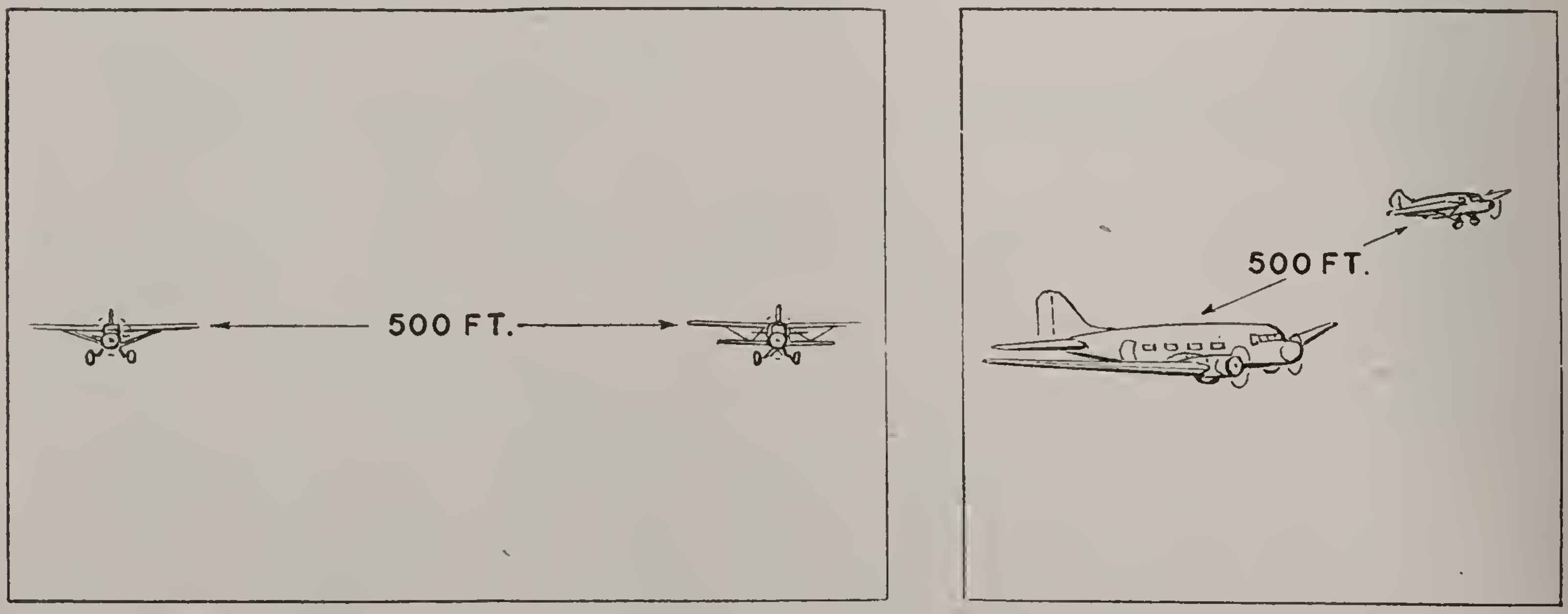

500 FT.
500 FT.

Figure 5.—Proximity in flight.

AIR TRAFFIC CONTROL

Airport traffic control is that control which provides safety in the landing and take-off operations at the airport, aircraft taxiing on the landing area, and aircraft in flight in the immediate vicinity of the airport. **Airway traffic control** is that control which provides for safety of aircraft in a given control area during periods of restricted visibility.

A comparison of the two types of traffic control is outlined below:

Airway Traffic Control	Airport Traffic Control
PERSONNEL	
Airway traffic control is exercised by Federal personnel.	Airport traffic control is exercised by Federal personnel at airports handling large volumes of both civil and military traffic and by local personnel representing the airport management at other airports.
LOCATION	
Airway traffic control centers are located at or near large airports for greater convenience and lower cost of land line communications.	Airport traffic control towers are located at the airport so that the operator will have a good view of the landing area and the surrounding air space.
JURISDICTION	
The airway traffic control center has jurisdiction over all aircraft flying in its control area, including the air space over any and all airports lying within its area. The extent to which this jurisdiction is exercised is dictated by the existing weather conditions together with the type of equipment, such as tower, and other navigational facilities at the airport concerned.	Airport traffic control is exercised over aircraft and vehicular traffic operating on the landing area of the control airport and aircraft in flight within 3 miles of the center of such control airports. Certain Federally operated airport traffic controls towers are designated as "approach control" towers. In these cases, certain functions and jurisdictions are delegated by the airway traffic control center concerned to the Civil Aeronautics Administration airport traffic control tower.
EXTENT OF CONTROL	
Airway traffic control is or may be continuous, while the aircraft is in flight on the civil airway. (See *Jurisdiction.*)	Airport traffic control is more immediate, generally short-lived in relation to each flight and is based upon reports received from the pilot, the airway traffic control center, and upon direct visual observation of traffic movements on and in the vicinity of the airport. In the case of departing aircraft, airport traffic control extends from the time the aircraft appears on the ramp at the airport of departure until it passes the boundary of the control zone.

Airway Traffic Control—Continued	**Airport Traffic Control—Continued**
EXTENT OF CONTROL—continued	
	In the case of arriving aircraft, assigned to the tower by the airway traffic control center concerned, the airport traffic control extends from the time the aircraft enters the control zone or establishes radio contact with the tower.
METHODS OF COMMUNICATIONS	
Airway traffic control communications are transmitted by interphone, teletype and pneumatic tube to airport traffic control towers, U. S. airway communications stations, air carrier and military radio stations and relayed by those agencies to pilots in flight by use of radio facilities.	Airport traffic control is exercised directly between tower personnel and aircraft pilots by radio and by the use of light signals when aircraft are not equipped with radio.
TRAFFIC CLEARANCES	
Airway traffic control personnel issue traffic clearances and instructions (approve flight plans and, as necessary to safety, amend flight plans.)	Airport traffic control personnel issue upon their own authority, such traffic clearances and instructions as pertain to flight of aircraft in the vicinity and operation of aircraft or vehicular traffic on the landing area of the control airport. Airport traffic control personnel relay to pilots, by radio, traffic clearances and instructions issued by an airway traffic control center.
INFORMATION TO PILOTS	
Airway traffic control personnel provide the pilot with information regarding other aircraft which will operate within certain time and altitude limits of aircraft concerned.	Airport traffic control personnel provide pilots using the airport with information concerning time checks, radio checks, altimeter settings, surface winds, other weather conditions, runway to be used, air traffic within the control zone, ground traffic on the landing area, restricted portions of the landing area and other field conditions.
SERVICES PERFORMED	
Issuing traffic control instructions and information to aircraft flying along the civil airways for the purpose of preventing collision between aircraft when weather conditions are such that pilots cannot see and be seen sufficiently to avoid collision.	Issuing traffic control instructions and information to aircraft taking off, landing and approaching for a landing for the purpose of preventing collision between aircraft in flight in the vicinity of the landing area.
Providing an orderly and well regulated flow of air traffic during restricted weather conditions so as to reduce to a minimum delay to aircraft in flight.	Issuing instructions to aircraft taxiing for the purpose of preventing collision between aircraft on the landing area and between aircraft and vehicular traffic on the landing area.

SERVICES PERFORMED—continued

Airway Traffic Control—Continued

Maintaining a progressive check of all aircraft for which flight plans have been filed and initiating action to locate overdue aircraft.

Warning pilots in flight on a flight plan when hazardous weather conditions develop and initiating action to supply the pilot with information concerning a suitable alternate airport or other desired change in flight plan.

Reporting aircraft accidents involving aircraft on a flight plan and providing aircraft in known difficulty with fullest possible assistance.

Providing Army Air Forces Fighter Command Offices with information necessary for the identification of friendly and enemy aircraft in air defense areas.

Disseminating instructions from military authorities for the blacking out of aeronautical lights and radio facilities.

Airport Traffic Control—Continued

Issuing current information on field conditions to pilots of aircraft so that they may be fully apprised of the suitability of the landing area for the safe completion of the operation involved.

Issuing appropriate warning to pilots of aircraft when malfunctioning of the aircraft which may not be readily apparent to the pilot is observed by the tower, such as flat tires, engine fires, wheels not down, etc.

Issuing appropriate warning to pilots of aircraft when meteorological conditions which may not be known to the pilot are observed or known to the tower.

Relaying messages concerning the operation, dispatch and control of aircraft between pilots of aircraft and operations offices, weather bureau offices, airway traffic control centers, and other appropriate agencies.

Issuing special information to pilots of aircraft when necessary in the interest of safety concerning aeronautical facilities, emergency landing areas, obstructions, landmarks, flying areas, restrictions, regulations, and/or any other appropriate information which may be of assistance to the pilot.

Inaugurating crash and emergency procedures when any emergency occurs on or in the vicinity of the landing area.

NONAPPLICATION OF AIR TRAFFIC RULES

The air traffic rules, or any particular air traffic rule, shall not apply when special circumstances render nonobservance necessary to avoid immediate danger, or when such nonobservance is required because of stress of weather conditions which could not reasonably have been foreseen, or other unavoidable causes. Such nonobservance shall be **reported within 24 hours** in full detail by letter to the Administrator, including a statement of the emergency making such nonobservance necessary, the results accomplished by nonobservance, and the time when regular observance was resumed after the emergency had passed. In such case of nonobservance, if, after investigation by the Administrator, nonobservance is deemed to have been necessary in the interests of safety, no infraction of these rules will have been incurred (60.900 (a).

CERTIFICATE OF WAIVER

When, in the opinion of the Administrator, (1) the public interest will be best served by the nonobservance of any part of the air traffic rules for a particular activity and for a limited period of time, and (2) such nonobservance will not adversely affect safety in air commerce, a certificate of waiver may be issued by the Administrator (60.91).

WEATHER CLASSIFICATION

Weather minimums are ceiling, visibility, and other minimums provided for specified types of flight operation, and below which flight operation is not permitted, unless specifically authorized elsewhere in these regulations or by the Administrator.

The local United States Weather Bureau reporting station for each control airport will classify existing weather conditions for such airport by one of the following symbols:

Class C—Contact.—Weather equal to or better than the minimums specified for the particular airport for flight in accordance with contact flight rules. (Satisfactory for contact flight.)

Class N—Instrument.—Weather less than the minimums specified for the particular airport for contact flight (Class C above) and down to the minimums prescribed for the particular airport for suspension of flight operations. (Requiring observance of instrument flight rules, unless contact flight procedure has been authorized.)

Class X—Closed.—Weather below the minimums specified for the particular airport, wherein any landing or take-off, other than a flight of public aircraft or scheduled air carrier aircraft if otherwise authorized, is suspended (60.145).

MINIMUM SAFE ALTITUDES

Exclusive of taking off from or landing upon an airport or other landing area, aircraft shall not be flown below the following minimum safe altitudes of flight:

(*a*) An altitude over the congested parts of cities, towns, or settlements, **sufficient to permit at all times an emergency landing outside of such areas** in the event of complete power failure, but in no case less than **1,000 feet** above the ground.

(*b*) **1,000 feet** above the ground over any Federal penal institution or any open-air assembly of persons.

(*c*) **500 feet** above the ground or water elsewhere than as specified, or within **500 feet** from any mountain, hill, or other obstruction to flight, except as may be specifically approved by the Administrator: *Provided, however,* That seaplanes and amphibians may be flown below 500 feet, but not below **300 feet,** if making a contact flight during **daylight** hours over open water and where an emergency landing may, at all times, be made, without the aid of power, into the wind and without danger of collision with craft on the surface or other obstructions: *And provided further,* That the restrictions of this paragraph shall not apply to public aircraft, previously authorized by the appropriate governmental agency, to make specific flights below such minimums in the public interest.

(*d*) **1,000 feet** above the ground or water, or within **1,000 feet** of any mountain, hill, or other obstruction to flight if an aircraft is making an **instrument flight.**

(*e*) Any maneuver required in student instruction or solo practice under the supervision of a certificated flight instructor, the Army, Navy, Marine Corps, or Coast Guard, or in flight tests given by an inspector of the Administrator, may be performed at an altitude less than 500 feet above the ground or water if necessary for the proper execution of such maneuver notwithstanding the provision of (*c*).

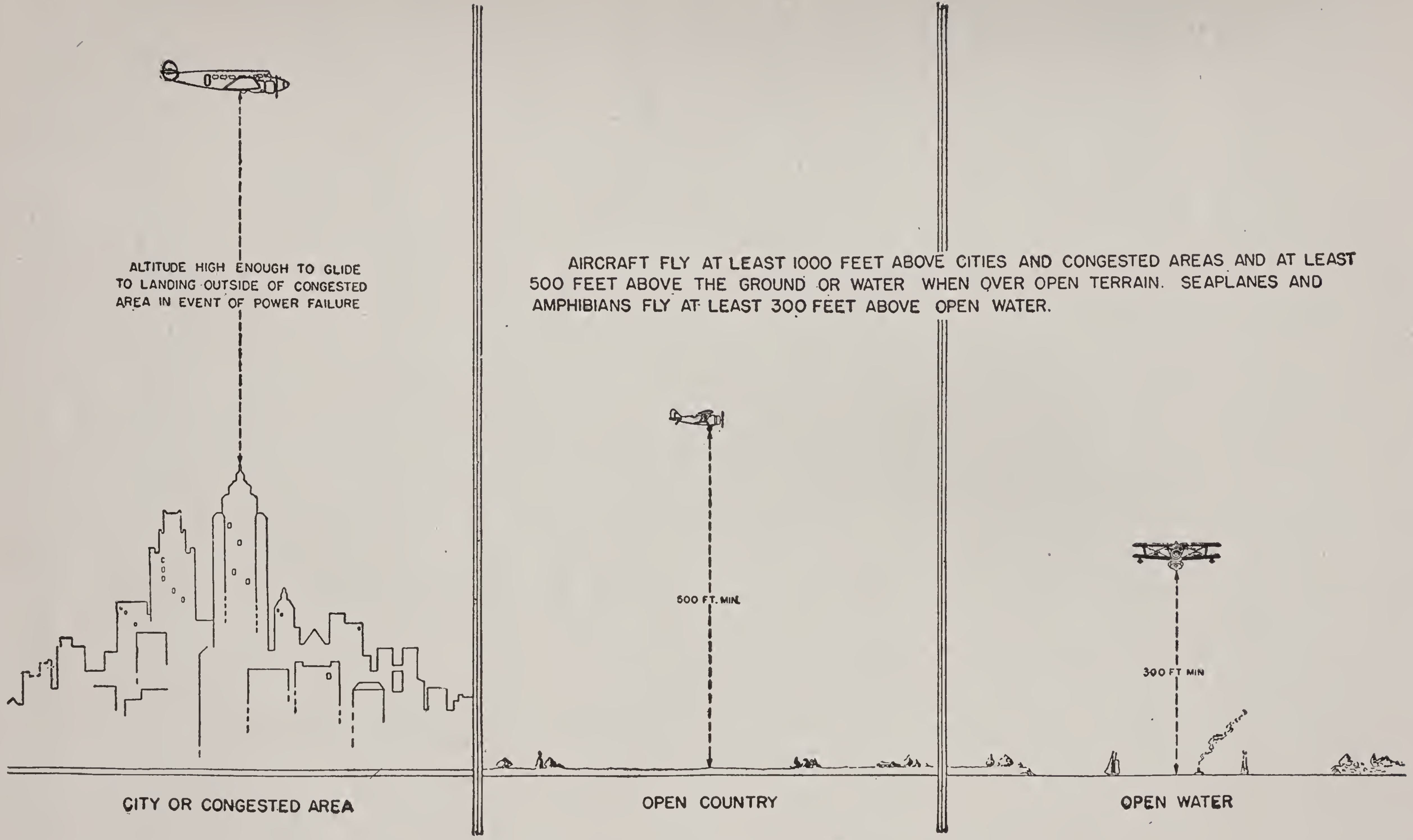

ALTITUDE HIGH ENOUGH TO GLIDE TO LANDING OUTSIDE OF CONGESTED AREA IN EVENT OF POWER FAILURE
AIRCRAFT FLY AT LEAST 1000 FEET ABOVE CITIES AND CONGESTED AREAS AND AT LEAST 500 FEET ABOVE THE GROUND OR WATER WHEN OVER OPEN TERRAIN. SEAPLANES AND AMPHIBIANS FLY AT LEAST 300 FEET ABOVE OPEN WATER.
500 FT. MIN.
300 FT MIN
CITY OR CONGESTED AREA
OPEN COUNTRY
OPEN WATER

Figure 6.—Minimum safe altitudes.

MAXIMUM SAFE ALTITUDES

Aircraft, except military aircraft, must not be flown at altitudes above 17,000 feet above sea level: *Provided, however,* That air carrier aircraft in scheduled air transportation may operate above that altitude when authorized by the terms of the air carrier operating certificate issued to the air carrier: *And provided further,* That the Administrator may authorize flights of aircraft above that altitude when necessary in the interests of safety or the development of aeronautics.

(*a*) Military aircraft when operating above 17,000 feet above sea level must be equipped with two-way radio equipment adequate to communicate at all times with either a ground radio station maintained by one of the armed forces of the United States or with an airway communications station of the Administrator. Such aircraft shall obtain a clearance from the appropriate airway traffic control center of the Administrator before ascending to or descending from that altitude if during such ascent or descent the aircraft enters into or passes through an airway traffic control area.

(*b*) Military aircraft while operating either contact or on instruments above the altitude of 17,000 feet above sea level in accordance with the above provisions shall be exempt from all other provisions of this part of the regulations except that such aircraft shall comply with the airplane light rules of § 60.61 and when flying along or crossing routes or civil airways approved for use by a scheduled air carrier authorized to operate above 17,000 feet, such military aircraft shall comply with the following flight altitudes:

(1) *Eastbound flights.*—Aircraft making good a true course of 0° (or 360°) to, but not including, 180° shall fly at an ODD thousand-foot level plus 500 feet, above sea level (such as 17,500, 19,500, or 21,500 feet); and

(2) *Westbound flights.*—Aircraft making good a true course of 180° to, but not including 360° (or 0°) shall fly at an EVEN thousand-foot level plus 500 feet, above sea level (such as 18,500, 20,500, or 22,500 feet).

(*c*) Aircraft practicing take-offs and landings under contact flight rules within an airway traffic control area shall not exceed an altitude of 1,500 feet above the airport from which such practice is being conducted.

LIGHT AND SIGNAL RULES

Aircraft Lights

Between sunset and sunrise, lights shall be as follows:

On airplanes

Position lights.

On airships

Same as airplanes, except side lights doubled horizontally in a fore-and-aft position and rear light doubled vertically.

Fixed.—three lights—red, white, and red—in a vertical line one over the other.

On balloons

Free.—one steady white light and one flashing red light.

Fixed.—same as fixed airship.

On stationary aircraft

Seaplanes.—anchor light showing in all directions.

Airships.—groups of three red lights on mooring cables.

Balloons.—same as airships and adequate lights to mark position of object to which balloon is moored.

Distress Signals

The following signals, separately or together, shall, where practicable, be used in case of distress:

(*a*) The international signal, S O S by radio: In radiotelephony, the spoken expression MAYDAY (corresponding to the French pronunciation of the expression "m'aider"). When, owing to the rapidity of the maneuvers to be accomplished, an aircraft is unable to transmit the intended message the signal P A N not followed by a message retains such meaning.

(*b*) The international code flag signal of distress, N C.

(*c*) A square flag having either above or below it a ball, or anything resembling a ball (60.66).

Forced Landing Signals

When an aircraft is forced to land at night at an airport, it shall signal its forced landing by making a series of short flashes with its navigation lights, if practicable to do so (60.67).

Fog Signals

In fog, mist, or heavy weather, an aircraft on the water in navigation lanes shall signal its presence by a sound device emitting a signal for about 5 seconds at 1-minute intervals (60.68).

Visual Signals

Aircraft equipped **with radio receiver only** must acknowledge signals in the daytime by movement of the ailerons or rudder on the ground and by rocking the wings in the air, and at night by flashing the landing light.

Aircraft **not equipped with radio** must observe the tower for light signals and acknowledge as above. The light signals with their respective meanings are as follows:

<table>
<tr><th rowspan="2">Signal</th><th colspan="3">Meaning of signal if airplane is—</th></tr>
<tr><th>Taxiing</th><th>Ready for take-off</th><th>In flight</th></tr>
<tr><td>Steady green</td><td></td><td>Cleared for take-off.</td><td>Cleared to land.</td></tr>
<tr><td>Flashing green</td><td>Continue taxiing.</td><td></td><td></td></tr>
<tr><td>Steady red</td><td>Stop</td><td>Clear the runway immediately and wait.</td><td>Give way to other aircraft and continue circling.</td></tr>
<tr><td>Flashing red</td><td>Return to hangar line.</td><td>Return to hangar line.</td><td></td></tr>
<tr><td>Alternating red and green</td><td colspan="3">General warning signal—exercise extreme caution.</td></tr>
</table>

PARACHUTES

No parachute shall be carried in a civil aircraft of the United States in a manner available for emergency use unless within the preceding 60 days it has been packed by a person certificated for that purpose in accordance with the Civil Air Regulations or by personnel of the Army, Navy, Marine Corps, or Coast Guard whose regular duty is to pack parachutes for use in such services (60.36).

ACROBATIC FLIGHT RULES

Acrobatics are unnecessary flight evolutions voluntarily performed with an aircraft requiring or resulting in an abrupt change in its attitude, an abnormal attitude, or operations in excess of the aircraft's design level flight speed (placard value). A normal bank not in excess of 70° will not be considered as an abrupt change in the aircraft's attitude or as an abnormal attitude.

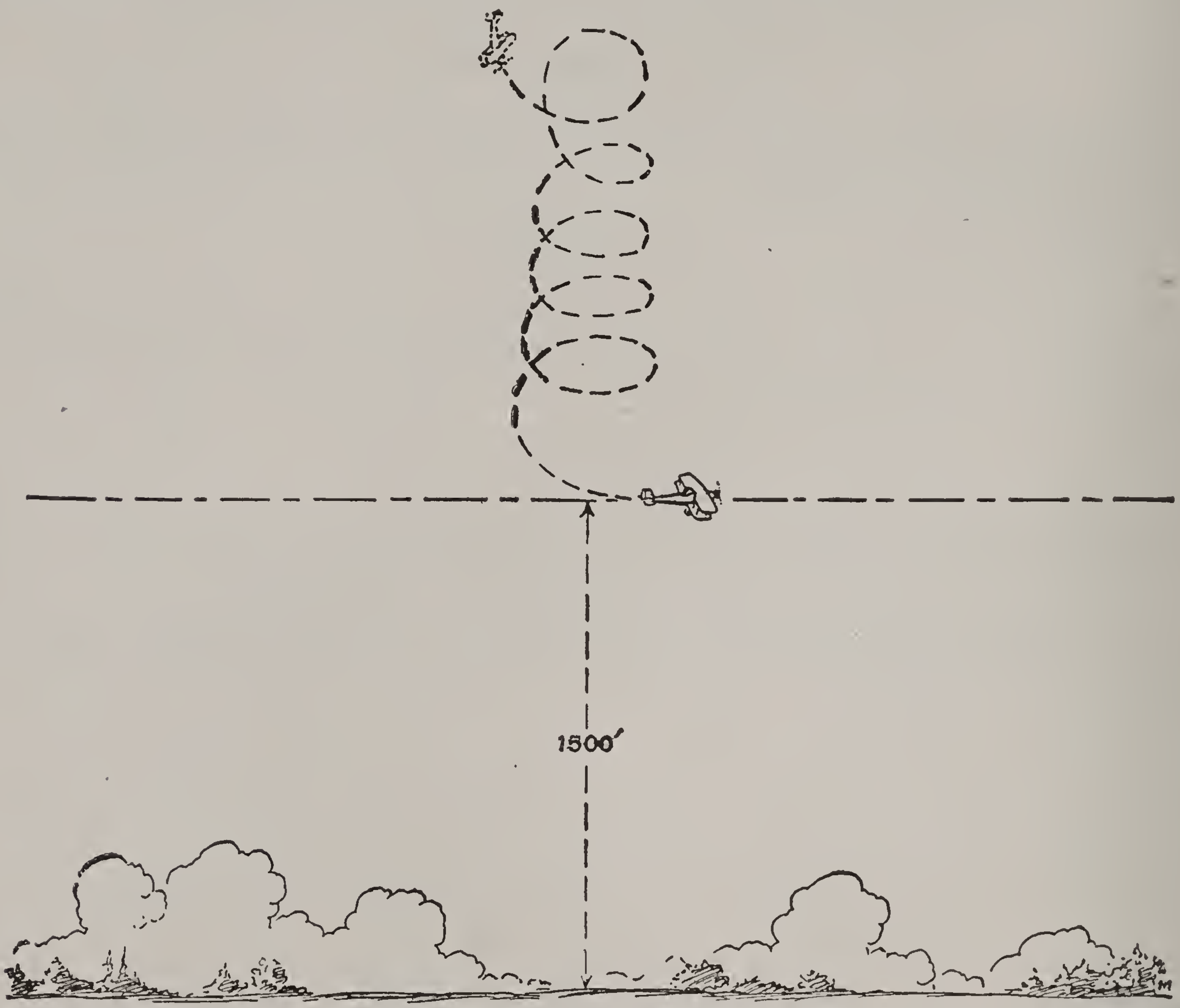


Figure 7.—Altitude for acrobatic flight.

No person shall acrobatically fly an aircraft—

(*a*) **At any height whatsoever over a congested area of any city, town, or settlement, or over any open-air assembly of persons, or over any airport or landing area or within 1,000 feet horizontally thereof, or within the limits of a civil airway except within that portion lying adjacent to, but outside of a range approach channel.**

(*b*) **At any height less than 1,500 feet over any place over which flight is not otherwise restricted.**

(*c*) **At any place unless the visibility is at least 3 miles and the ceiling at least 3,000 feet, and unless the pilot has first ascertained that there is no danger of collision with other aircraft** (60.70).

NOTE: No acrobatics may be performed in a range approach channel.

No person shall acrobatically fly an aircraft while carrying any other person or persons for hire: *Provided, however,* that this provision shall not apply to the giving of instruction in acrobatic flying to a person receiving dual instruction (60.71).

Each person in an aircraft flown acrobatically shall be properly equipped with a **parachute** manufactured under a valid type certificate and maintained in accordance with the provisions of the Civil Air Regulations (60.72).

PARACHUTE JUMPS

No person shall make any exhibition, test, *training*, or demonstration parachute jump—

(1) unless he has obtained from the Administrator a permit which describes the equipment and conditions;

(2) unless he has presented such permit to the person in command of the aircraft and received permission to make the jump;

(3) unless he is wearing a certificated and properly maintained auxiliary parachute of a single-harness pack;

(4) from an altitude of less than 2,000 feet above the surface of the ground or water;

(5) from an aircraft when the surface wind is more than 15 miles per hour;

(6) from an aircraft within 2 miles horizontally from a body of water unless he is wearing a flotation device approved by the Administrator and motor-powered marine rescue equipment is available.

Exception: A pilot or person in command of a civil aircraft in flight may permit a parachute jump from such aircraft to abandon the aircraft in distress notwithstanding the above provisions.

No person shall delay opening his parachute more than is necessary in order to clear the aircraft properly and safely, which in no case except in an emergency jump shall be less than 1,500 feet above the surface of the ground.

CONTACT FLIGHT RULES

Aircraft Requirements

Equipment.—See Chapter VI. Although the equipment for contact flight does not include radio, the use of at least a radio receiver makes it possible for the pilot to avail himself more fully of the facilities provided by the civil airways.

Fuel.—No aircraft shall take off without sufficient fuel and oil, taking into account wind and other weather conditions to be encountered during the course of the flight, to arrive at its point of first intended landing and effect a safe landing thereat (60.42).

Weather Minimums

Proximity to cloud formation.—Aircraft shall not be flown closer than 500 feet vertically to an overcast or cloud formation nor closer than 2,000 feet horizontally to a cloud formation.

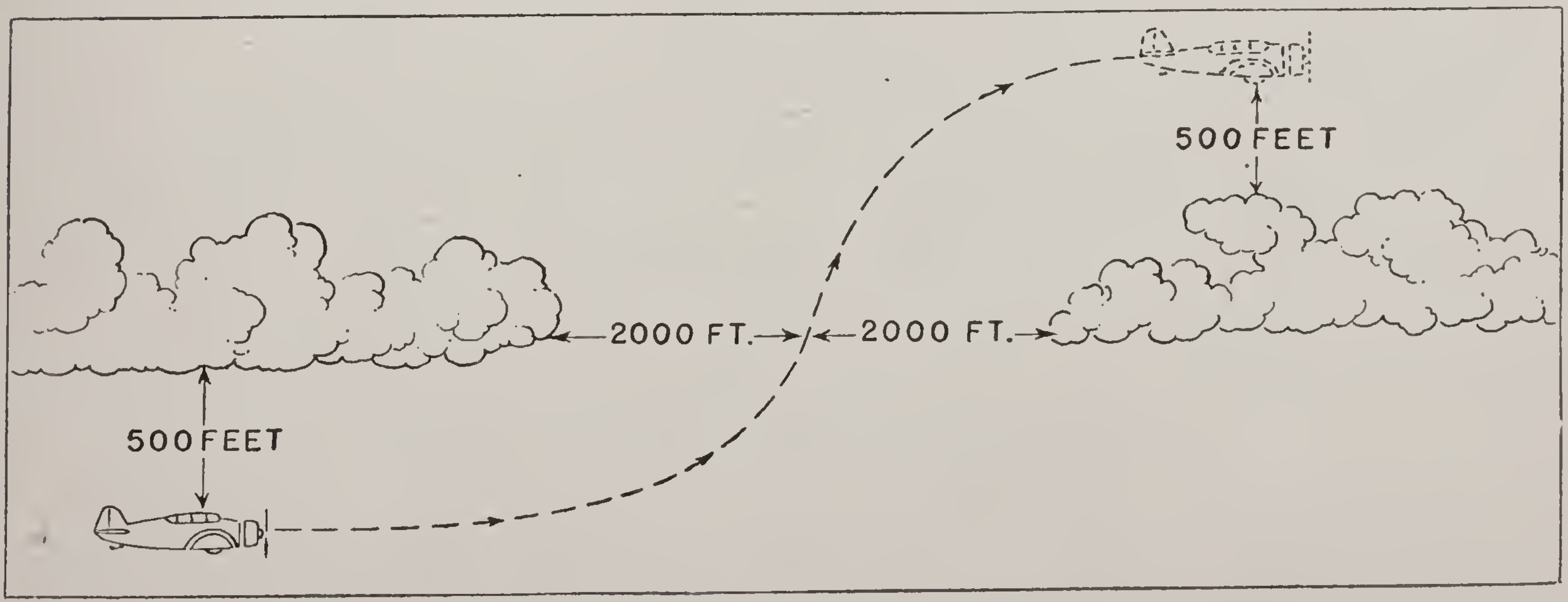
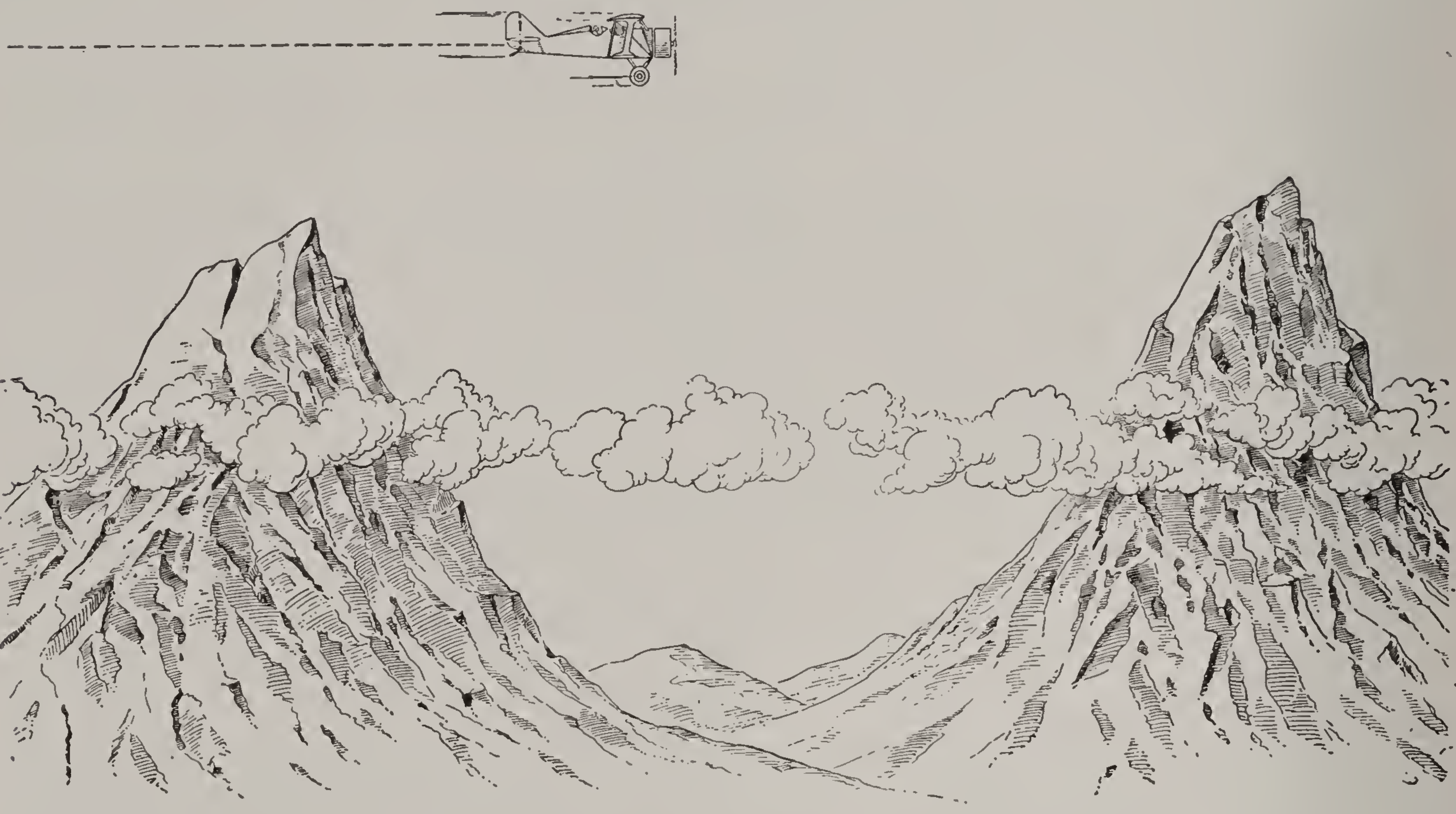


Figure 8.—Ascent through cloud level.

Over-the-Top Flight

No flight of aircraft shall be made over broken clouds or stretches of solid overcast unless the **attitude** of the aircraft and its **flight path** can at all times be controlled by **visual reference** to the ground or water, and ascent and descent can be made in accordance with the minimum distance provisions set forth above (60.46).



AIRCRAFT BEING FLOWN IN ACCORDANCE WITH THE RULES PREVIOUSLY PORTRAYED, MAY BE FLOWN ON TOP OF A CLOUD FORMATION IF THE ATTITUDE AND THE FLIGHT PATH OF THE AIRCRAFT CAN AT ALL TIMES BE CONTROLLED BY VISUAL REFERENCE TO THE GROUND OR WATER.

Figure 9.—Over-the-top contact flight.

Ceiling and Visibility Minimums

Position	Minimum ceiling	Minimum visibility
Within control zones	1,000 feet	3 miles.
Outside control zones:		
At or below 1,000 feet	Sufficient to permit flight at prescribed minimum safe altitudes.	1 mile—day. 2 miles—night.
Above 1,000 feet	Sufficient to permit flight at prescribed minimum safe altitudes.	3 miles at flight altitude.

Exceptions to Weather Minimum Rules

(1) An airway traffic control center of the Administrator may, for reasons of safety, restrict or suspend contact flight operation within the airway traffic control area of such center.

(2) In the interests of safety, the Administrator may require higher minimums at any particular control airport, and such minimums shall govern the control zone in which such control airport lies.

(3) A certificated air-traffic control-tower operator on duty in a radio-equipped airport control tower may suspend contact flight operations within the control zone when reasons of safety require such action.

(4) A certificated air-traffic control-tower operator may authorize flight at altitudes of 1,000 feet or less above the ground or water when the visibility is less than 3 miles but not less than 1 mile.

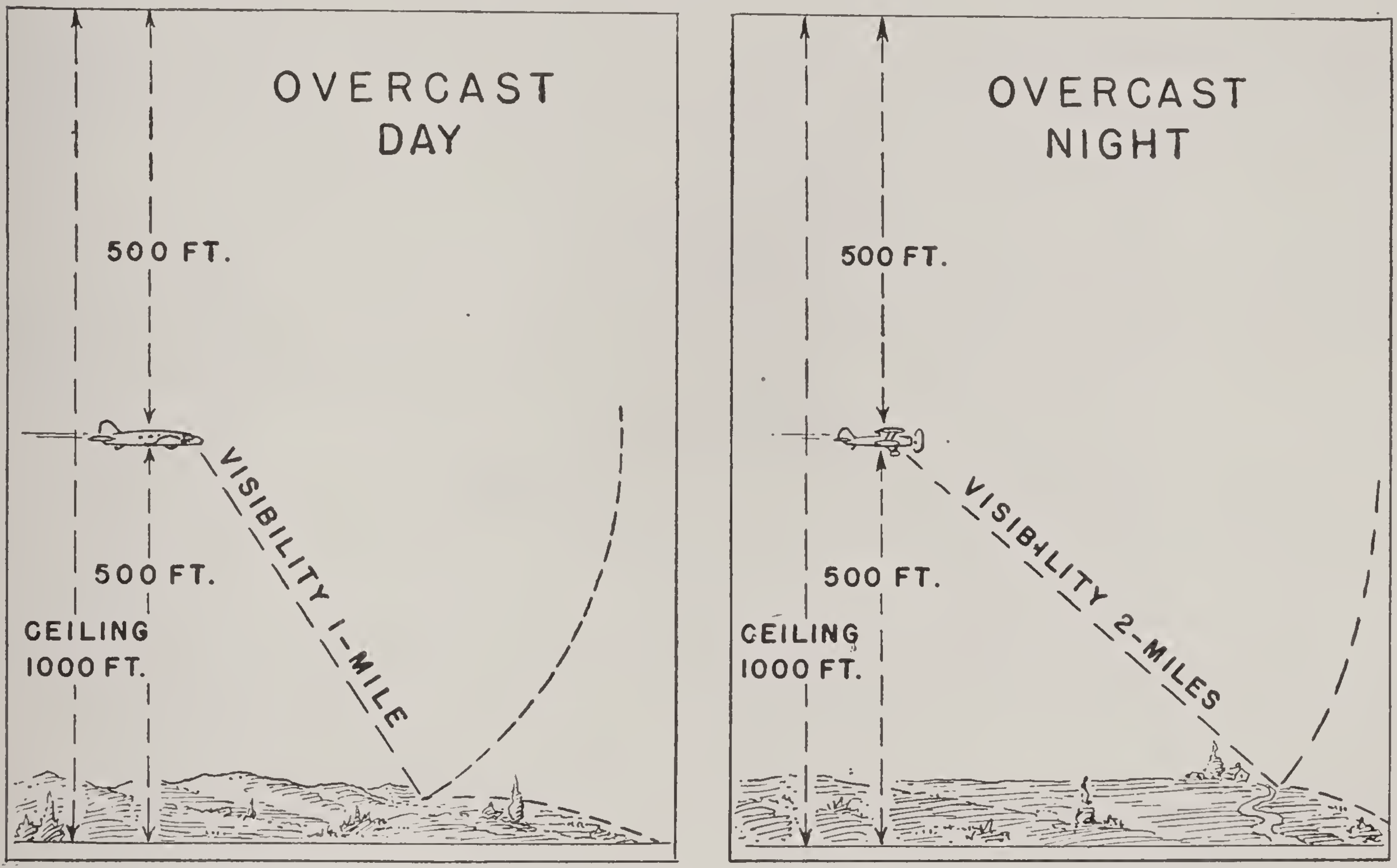


Figure 10.—Minimum ceiling and visibility. (Contact flight outside a control zone.)

Weather Changes

If weather conditions below the minimums prescribed for contact flight are **anticipated** or are actually encountered en route, a **landing must be made** at the nearest airport at which weather conditions are equal to or better than those prescribed, or the flight must be altered so that it may be made in weather conditions as good as, or better than, such minimums, unless such flight can and does proceed in accordance with the instrument flight rules (60.470).

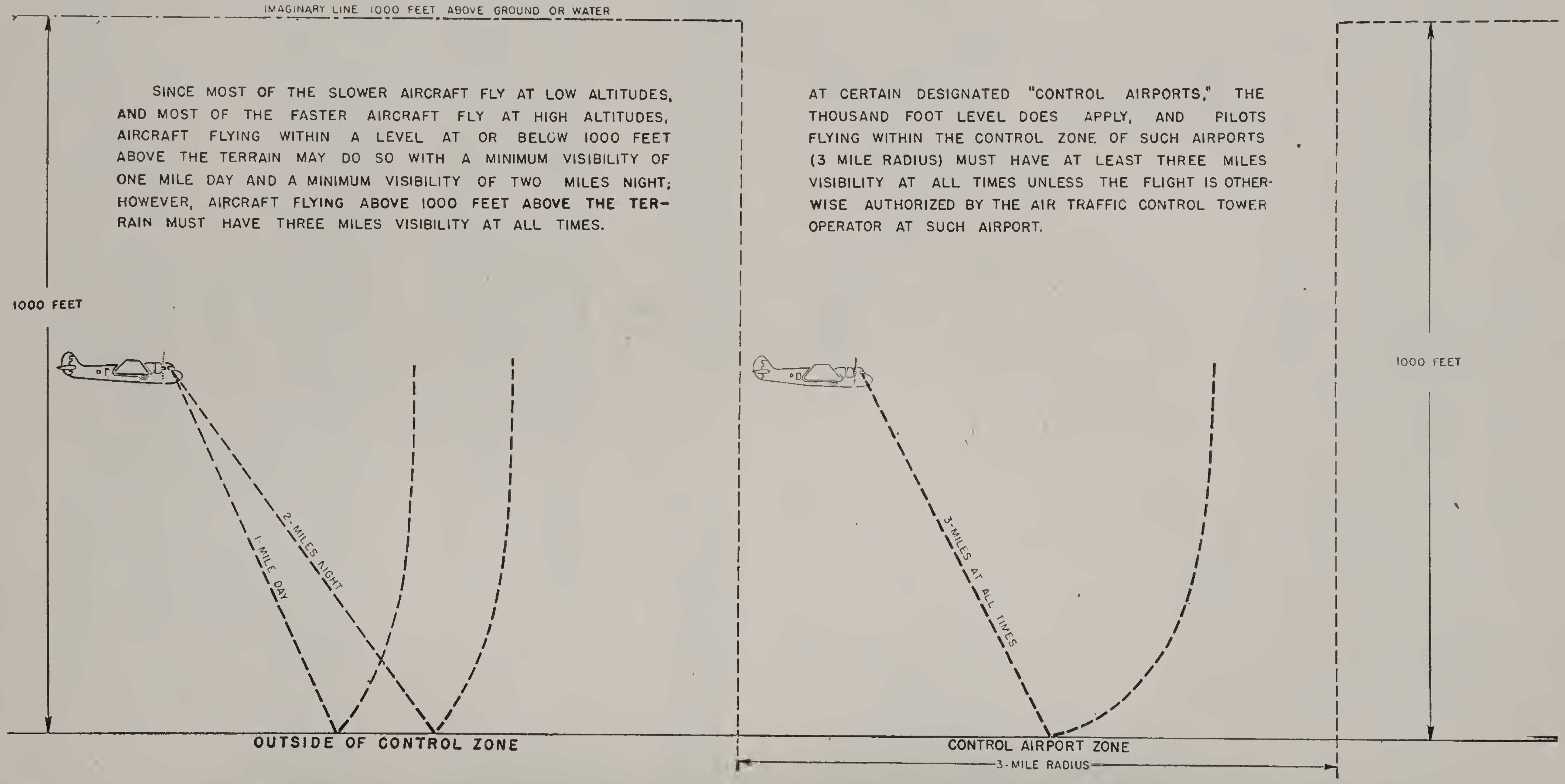
Flight Plan

A flight plan is not required for contact flight unless the flight is made at night and lies within or passes through airway traffic control areas.

The contact flight plan shall contain the following information:

(*a*) Identity of pilot and aircraft.
(*b*) Time and point of departure.
(*c*) Proposed cruising altitude or altitudes.
(*d*) Proposed route to be followed.
(*e*) Destination and estimated time of arrival.
(*f*) Usable radio equipment carried in aircraft, if any.
(*g*) Number of aircraft making the flight, if the aircraft are to be flown in formation (60.1330).

Alternate Airport.—No alternate airport is required for contact flight.



SINCE MOST OF THE SLOWER AIRCRAFT FLY AT LOW ALTITUDES, AND MOST OF THE FASTER AIRCRAFT FLY AT HIGH ALTITUDES, AIRCRAFT FLYING WITHIN A LEVEL AT OR BELOW 1000 FEET ABOVE THE TERRAIN MAY DO SO WITH A MINIMUM VISIBILITY OF ONE MILE DAY AND A MINIMUM VISIBILITY OF TWO MILES NIGHT; HOWEVER, AIRCRAFT FLYING ABOVE 1000 FEET ABOVE THE TERRAIN MUST HAVE THREE MILES VISIBILITY AT ALL TIMES.

AT CERTAIN DESIGNATED "CONTROL AIRPORTS," THE THOUSAND FOOT LEVEL DOES APPLY, AND PILOTS FLYING WITHIN THE CONTROL ZONE OF SUCH AIRPORTS (3 MILE RADIUS) MUST HAVE AT LEAST THREE MILES VISIBILITY AT ALL TIMES UNLESS THE FLIGHT IS OTHERWISE AUTHORIZED BY THE AIR TRAFFIC CONTROL TOWER OPERATOR AT SUCH AIRPORT.

Figure 11.—Visibility at various altitudes (contact flight).

Flight Altitudes

Aircraft flying under contact flight rules shall maintain the minimum safe altitudes described in the preceding general flight rules.

Aircraft flying under contact flight rules along or across a civil airway during the **night,** except for necessary ascent and descent, shall **maintain** flight **altitudes prescribed** for **instrument flight;** and a **flight plan** in accordance with the above **shall be filed** for any such flights which are to lie within or pass **through airway traffic control areas.**

Aircraft flying under contact flight rules along or across a civil airway **during the day,** except for necessary ascent or descent, shall **maintain** flight **altitudes prescribed** for **instrument flight** as nearly as existing conditions permit (60.471).

Notification of Arrival

If the pilot of an aircraft has submitted, or authorized the submission of, a flight plan for transmission to destination, he must, immediately upon landing or upon completion of the flight, file an arrival message for transmission to the point of departure (60.430).

Review Questions

1. What provision must be made before starting an airplane engine?
2. What are the local field traffic rules for the landing field at which you are based?
3. What are the local field traffic rules for the landing fields at which you may land in your student cross-country flights?
4. What precautions must be taken with reference to other aircraft before taking off from an airport or landing field?
5. State the circle rule.
6. What path must be followed by an aircraft approaching an airport for a landing?
7. List the classes of aircraft in the order in which they have right-of-way over other aircraft.
8. State the rules of right-of-way for aircraft in flight and when taking off or landing.
9. What is the closest proximity at which aircraft may ordinarily be flown?
10. Under what conditions may exceptions be made to the rule referred to in No. 9 above?
11. On which side of the radio range course or center line on a civil airway must a pilot fly?
12. What is the major difference between airway and airport traffic control?
13. Is it ever possible to disregard any particular air traffic rule or rules?
14. What is the purpose of a certificate of waiver?
15. Name the classes of weather according to the United States Weather Bureau, as applied to a control airport.
16. Is 1,000 feet always a permissible altitude for flight of aircraft over cities or towns?
17. What do you consider to be the reason for the regulation that an aircraft shall not be flown above an open-air assembly of persons at an altitude lower than 1,000 feet? Over a Federal penal institution?
18. What are the minimum safe altitudes for aircraft flying above the ground and water?
19. State the regulation regarding the minimum distance from mountains or other obstacles to flight.

20. If a pilot is making an instrument flight, what is the minimum altitude he must maintain above the ground or water?
21. What is the maximum altitude for practicing take-offs and landings under contact flight rules within an airway traffic control area?
22. What lights are required to be on an airplane flying at night?
23. How would you identify an aircraft as a free balloon by its lights at night? As an airship?
24. What is the distress signal used in radio?
25. What are the distress signals used in radiotelephony?
26. In flying at night what signal is used to indicate a forced landing?
27. If an aircraft is not equipped with radio, how must acknowledgment of signals from the tower be made?
28. Describe the various light signals and give their meanings.
29. How often must a parachute be repacked and who may repack it?
30. Define acrobatic flight.
31. What is the requirement regarding avoidance of other aircraft in acrobatic flight?
32. What are the requirements as to ceiling and visibility for acrobatic flight?
33. May passengers be carried during acrobatic flight?
34. What is the minimum altitude for acrobatic flight?
35. May an aircraft be flown acrobatically within the limits of a civil airway?
36. May an aircraft be flown acrobatically within the limits of a radio approach channel?
37. Under what circumstances is a person permitted to make a parachute jump when wearing only one parachute?
38. What equipment is required for a parachute jump where no emergency exists?
39. Why is radio equipment desirable in contact flight on a civil airway?
40. What is the fuel regulation for contact flight on civil airways?
41. State the minimum distances vertically and horizontally from overcasts or cloud formations at which a contact flight may be made.
42. What visibility conditions must prevail in order that contact flight may be made over broken clouds?
43. State the minimum ceiling and visibility requirements for contact flight.
44. Under what circumstances may the traffic control center of the Administrator suspend contact flight within a particular airway traffic control area?
45. What discretion is allowed certificated air-traffic control-tower operators?
46. If, during a flight, weather conditions are encountered or anticipated below the minimums prescribed for contact flight, what is the pilot to do?
47. When is a flight plan required for contact flight?
48. What information must a contact flight plan contain?
49. State the minimum altitudes for contact flight of civil aircraft.
50. Under contact flight rules what altitudes must be maintained when flying along or across a civil airway?
51. Is an alternate airport required for contact flight?
52. Under what conditions is a pilot who has completed a contact flight required to file an arrival message? What is the reason for this requirement?

Chapter II.—INSTRUMENT FLIGHT RULES

In addition to general or special air traffic rules which apply, the following rules shall govern instrument flight, flight in closer proximity to cloud formation than the distances prescribed in weather minimums for contact flight, and flight in weather conditions worse than those described, within or approaching the limits of a civil airway or elsewhere in interstate, overseas, or foreign air commerce.

PILOT REQUIREMENTS

No flight shall be made in civil aircraft unless the pilot in charge

(*a*) holds a valid instrument rating; or

(*b*) holds a valid airline transport pilot certificate; or

(*c*) holds a valid commercial lighter-than-air pilot certificate; or

(*d*) is an active member of the regular Army, Navy, Marine Corps, or Coast Guard, or a reserve member of any such service on extended active duty for at least 1 year, and who holds at least a private pilot certificate issued by the Administrator and a military instrument flying rating, or equivalent, issued by his service (60.50).

AIRCRAFT REQUIREMENTS

Equipment

Aircraft shall be properly certificated as to equipment according to the provisions described in Part 04 of the Civil Air Regulations.

Fuel

No aircraft shall take off without fuel and oil sufficient, considering the wind and other weather conditions forecast for the flight, at least

(*a*) to complete such flight to the point of the first intended landing, and thereafter

(*b*) to fly to and land at the alternate airport designated in the approved flight plan, and thereafter

(*c*) to fly, at normal cruising consumption, for a period of 45 minutes (60.52).

WEATHER MINIMUMS

Ceiling and Visibility Minimums

Position	Minimum ceiling	Minimum visibility
Within control zones	500 feet	1 mile.
Outside control zones	500 feet	1 mile.
At alternate airports—		
Equipped with radio directional aid:		
If overcast exists	2,000 feet	3 miles.
If broken clouds exist	1,500 feet	3 miles.
Not equipped with radio directional aid	Unlimited	3 miles.

Exceptions to Weather Minimum Rules

(1) In the interest of safety, the Administrator may require higher minimums at any airport. If such an airport is a control airport, these higher minimums shall govern the control zone in which the airport lies.

(2) If the control airport is equipped with radio directional aid to air navigation designed to direct aircraft to that airport by the aid of instrument, a certificated air-traffic control-tower operator on duty in a radio-equipped airport control tower in operation at such airport may authorize departure from such control airport when ceiling is not less than 300 feet and visibility is not less than one-half mile.

(3) These rules do not apply to flights by public aircraft or scheduled air carrier aircraft from or to a regular terminal or scheduled intermediate stop on the regular route.

Weather Changes

If weather reports available to the pilot en route indicate that the weather conditions will be below the minimums allowing operation into the airport of destination at the expected time of arrival, the pilot shall not attempt a landing at the airport of destination, but shall either proceed to the appropriate alternate airport as provided for or proceed to an airport where weather conditions are at such time equal to or better than those described in the weather minimums (60.570).

Communications Contacts

The pilot shall maintain a continuous listening watch on the appropriate radio frequency and shall, by radio, contact and report as soon as possible to the appropriate communication station the time and altitude of passing each radio fix or other checkpoint designated by the Administrator or specified in the flight plan together with unanticipated weather conditions being encountered and any other information pertinent to the aircraft movement (60.571).

Communications Failure

In the event of the electrical or the mechanical failure of aircraft two-way communication equipment or in the event that the pilot does not receive radio signals sufficient to permit him to maintain instrument navigation, one of the following procedures shall be observed:

(*a*) he may continue flight in accordance with contact flight rules; or

(*b*) he may effect a landing at the nearest suitable airport at which favorable weather conditions exist; or

(*c*) in the event weather conditions do not permit the above procedures, the pilot may, when sufficient radio signals are received, proceed according to his flight plan, including any amending instructions issued and acknowledged en route, with particular attention to maintaining his last acknowledged assigned altitude until the approach time last authorized for and acknowledged by the pilot of such aircraft, after which landing may be made (60.572).

FLIGHT PLAN

Prior to take-off from any point within an airway traffic control area and prior to entering such an area, an approved flight plan is required. No flight plan shall be submitted until after the pilot has made a careful study of available current weather reports and forecasts and believes the flight can be made with safety (60.53).

The flight plan shall contain the following information:

(*a*) The aircraft identification mark, or the name of the Governmental service in which the aircraft is employed, if so employed, or the name of the air carrier operator and the trip number, if engaged in scheduled air transportation service.

(*b*) The type of aircraft involved and the number of aircraft making the flight, if the aircraft are in formation.

(*c*) The name of the pilot, or the flight commander if the aircraft are in formation.

(*d*) The point of departure of the particular flight for which such plan is being filed.

(*e*) The proposed cruising altitude or altitudes and the route to be followed.

(*f*) The point of first intended landing.

(*g*) The proposed cruising air speed.

(*h*) Transmitter frequency.

(*i*) The proposed time of departure. (The time of departure shall be considered as the time when the aircraft leaves the ground.)

(*j*) The estimated elapsed time until arrival on the ground at the point of first intended landing. (For scheduled operation, the first stop to be made, together with additional stops, if requested by an airway traffic control center.)

(*k*) The alternate airport or airports.

(*l*) Any other pertinent information which the pilot deems useful for control purposes or which may be requested by an airway traffic control center (60.1331).

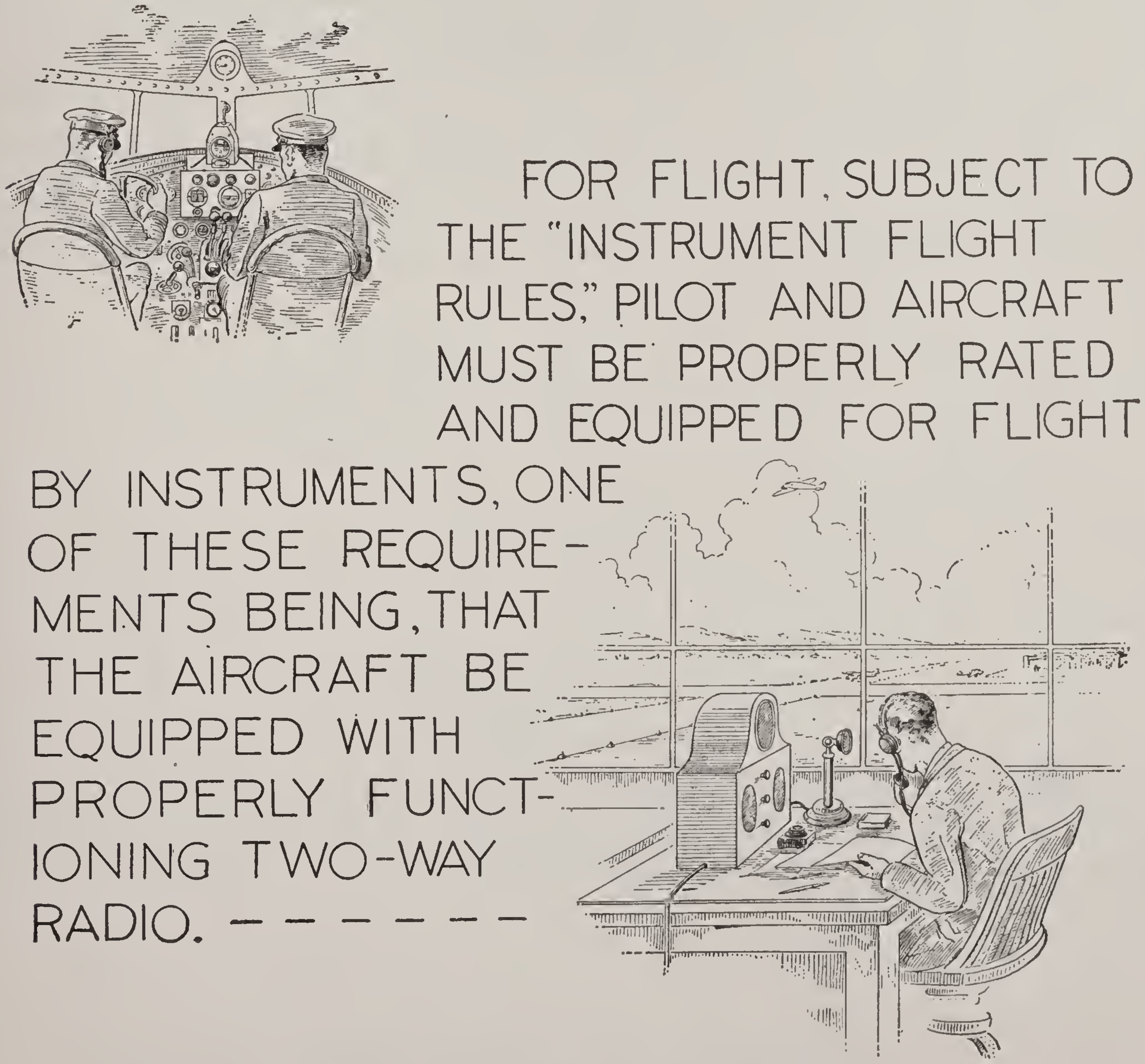

FOR FLIGHT, SUBJECT TO THE "INSTRUMENT FLIGHT RULES," PILOT AND AIRCRAFT MUST BE PROPERLY RATED AND EQUIPPED FOR FLIGHT BY INSTRUMENTS, ONE OF THESE REQUIREMENTS BEING, THAT THE AIRCRAFT BE EQUIPPED WITH PROPERLY FUNCTIONING TWO-WAY RADIO. – – – – – –

Figure 12.—Radio equipment for instrument flight.

Flight Plan Changes

No change shall be made en route in any approved flight plan until approval has first been obtained from the airway traffic control center of the Administrator for the area in which the flight is progressing, unless an emergency situation arises which requires immediate decision and action, in which case, as soon as possible after such emergency authority is exercised, the pilot shall inform the proper control center of the new flight plan and obtain approval therefor (60.573).

TRAFFIC CONTROL

En Route

No person shall operate an aircraft en route contrary to traffic control instructions issued by an airway traffic control center of the Administrator.

Approach

No person shall operate an aircraft during an approach for landing at a control airport contrary to traffic control instructions issued by a certificated air traffic control tower operator of the Administrator on duty at such airport (60.530).

PILOTS ARE REQUIRED TO MAINTAIN A CONSTANT LISTENING WATCH ON THE APPROPRIATE RADIO FREQUENCY IN ORDER THAT THEY MAY BE READY TO RECEIVE ANY AIR TRAFFIC CONTROL INSTRUCTIONS WHICH MAY BE ISSUED BY AN AIRWAY TRAFFIC CONTROL CENTER.

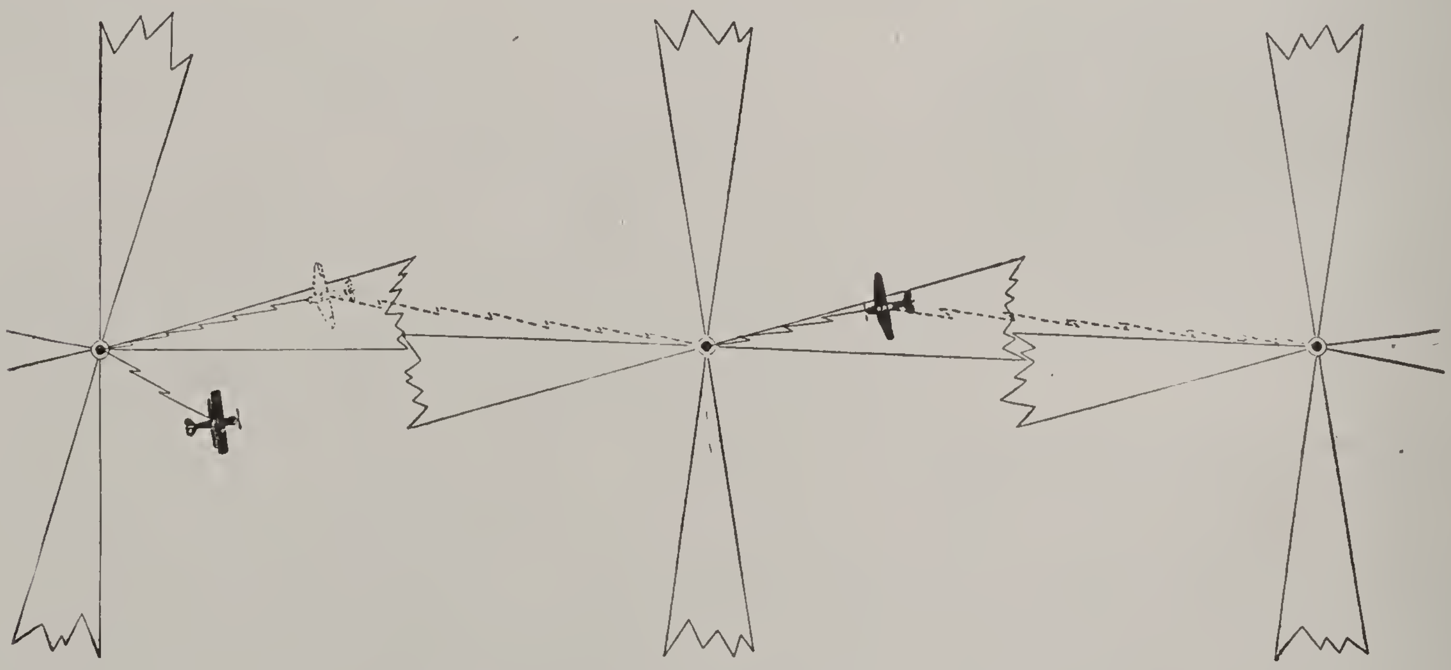
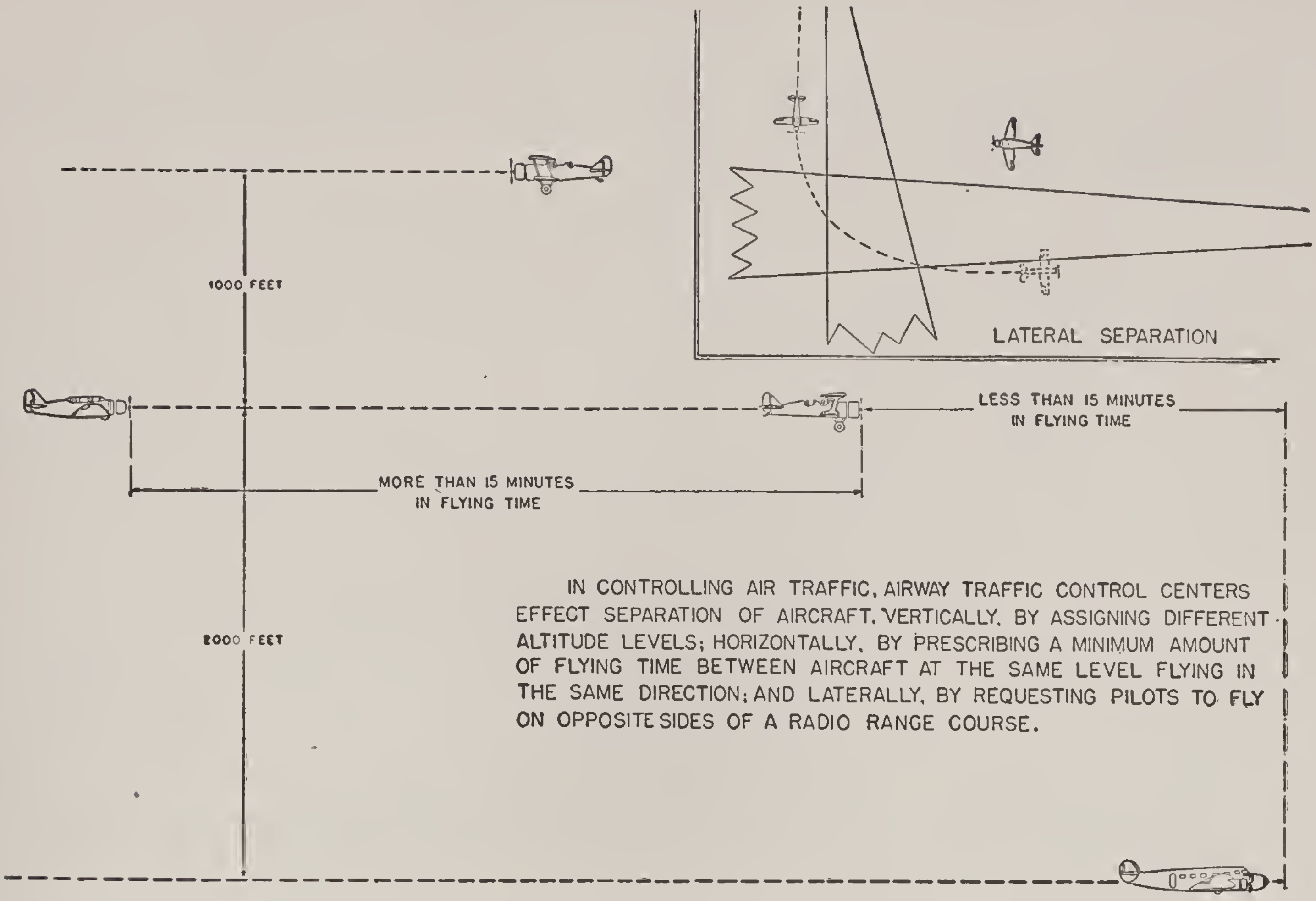


Figure 13.—Listening watch for instrument flight.

Over-the-Top Flight

Over-the-top flight shall be governed by instrument flight rules whenever the attitude of the aircraft and its flight path cannot be controlled at all times by visual reference to the ground or water (60.56).


LATERAL SEPARATION
1000 FEET
LESS THAN 15 MINUTES IN FLYING TIME
MORE THAN 15 MINUTES IN FLYING TIME
2000 FEET
VERTICAL AND HORIZONTAL SEPARATION

IN CONTROLLING AIR TRAFFIC, AIRWAY TRAFFIC CONTROL CENTERS EFFECT SEPARATION OF AIRCRAFT, VERTICALLY, BY ASSIGNING DIFFERENT ALTITUDE LEVELS; HORIZONTALLY, BY PRESCRIBING A MINIMUM AMOUNT OF FLYING TIME BETWEEN AIRCRAFT AT THE SAME LEVEL FLYING IN THE SAME DIRECTION; AND LATERALLY, BY REQUESTING PILOTS TO FLY ON OPPOSITE SIDES OF A RADIO RANGE COURSE.

Figure 14.—Separation of aircraft in instrument flight.

Crossing a Civil Airway

Unless otherwise instructed by an airway traffic control center of the Administrator, a civil airway shall not be crossed at an angle of less than 45° to such airway (60.58).

Note: The old requirement that aircraft on instrument flight plan increase their altitude 500 feet upon crossing an airway has been abolished.

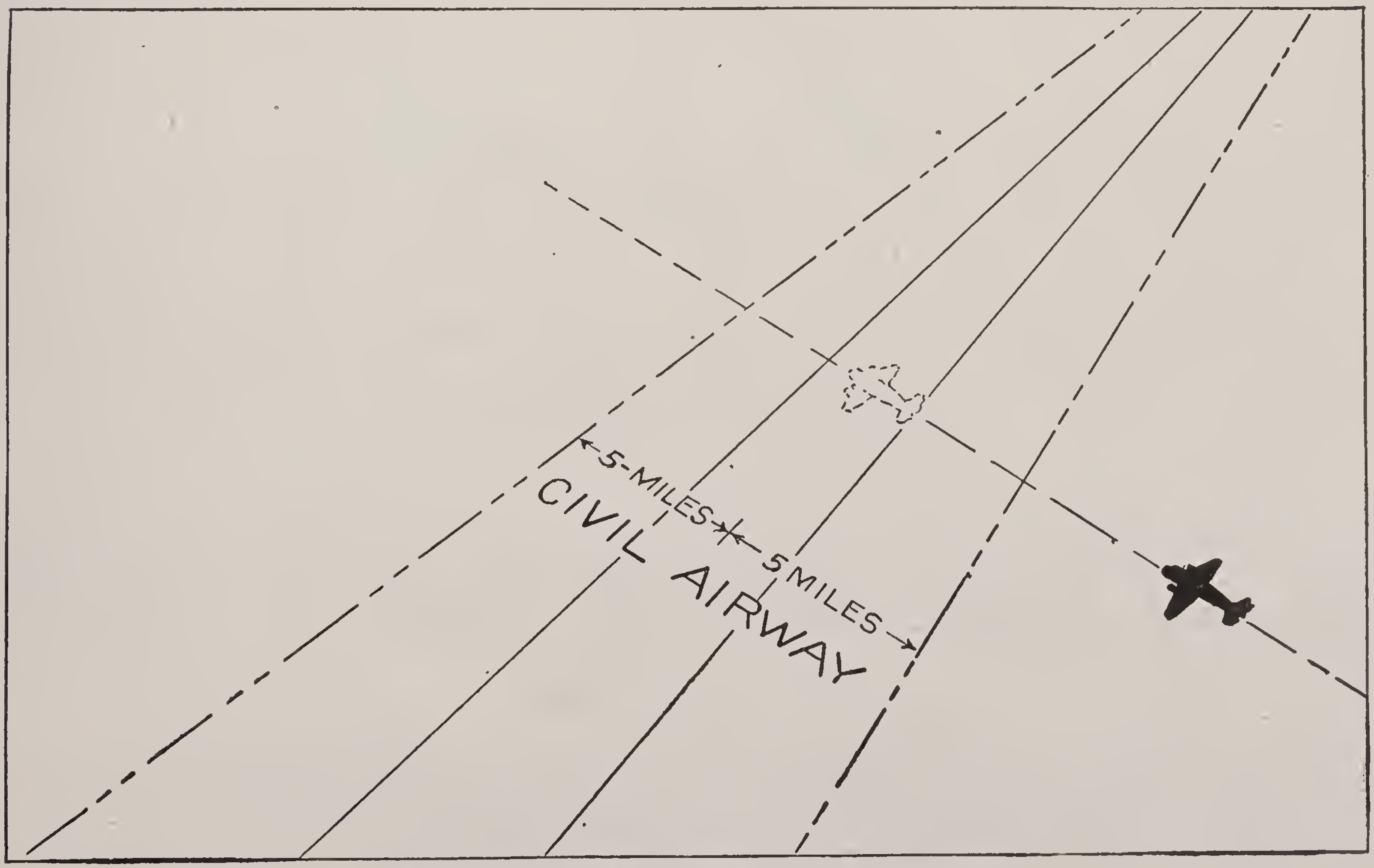


Figure 15.—Crossing a civil airway (at least 45° angle).

FLIGHT ALTITUDES

Unless different altitudes are assigned by an airway traffic control center of the Administrator, the following flight altitudes shall govern flights made in accordance with instrument flight rules.

Along Green or Red Civil Airways

Eastbound flights.—Aircraft making good a true course of from 0° (or 360°) to, but not including, 180° shall fly at an ODD thousand-foot level above sea level (such as 3,000, 5,000, or 7,000 feet).

Westbound flights.—Aircraft making good a true course of from 180° to, but not including, 360° (or 0°) shall fly at an EVEN thousand-foot level above sea level (such as 2,000, 4,000, or 6,000 feet).

Along Blue or Amber Civil Airways

Northbound flights.—Aircraft making good a true course of from 270° to, but not including, 90° shall fly at an ODD thousand-foot level above sea level (such as 3,000, 5,000, or 7,000 feet).

Southbound flights.—Aircraft making good a true course of from 90° to, but not including, 270° shall fly at an EVEN thousand-foot level above sea level (such as 2,000, 4,000, or 6,000 feet).

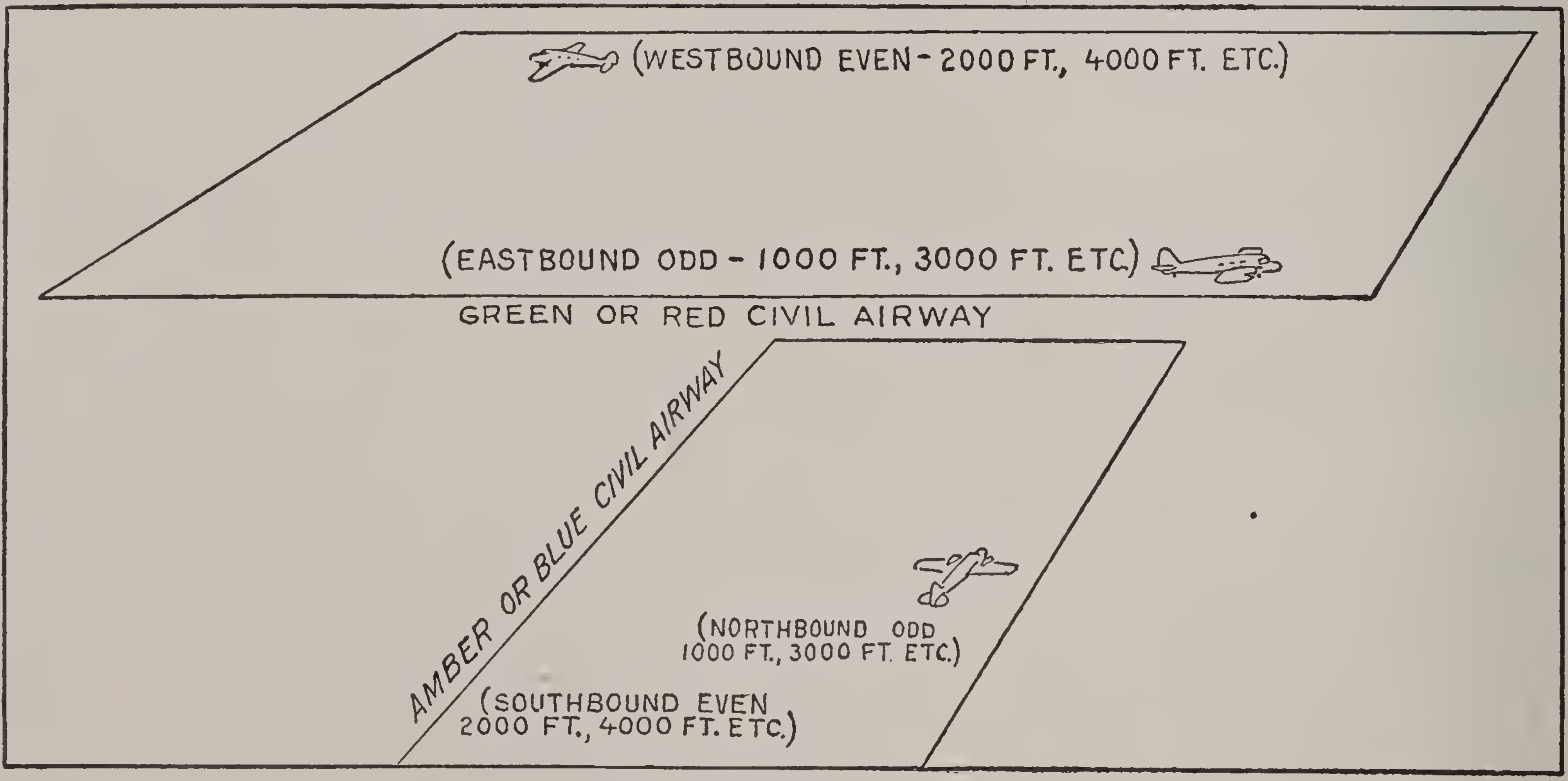

(WESTBOUND EVEN - 2000 FT., 4000 FT. ETC.)
(EASTBOUND ODD - 1000 FT., 3000 FT. ETC.)
GREEN OR RED CIVIL AIRWAY
AMBER OR BLUE CIVIL AIRWAY
(NORTHBOUND ODD 1000 FT., 3000 FT. ETC.)
(SOUTHBOUND EVEN 2000 FT., 4000 FT. ETC.)

Figure 16.—Flight altitudes.

NOTIFICATION OF ARRIVAL

If the pilot of an aircraft has submitted, or authorized the submission of, a flight plan for transmission to destination as provided for, he shall, immediately upon landing or upon completion of the flight, file an arrival message for transmission to the point of departure.

Review Questions

1. Under what conditions must instrument flight rules be applied?
2. What rating must a pilot hold to make an instrument flight?
3. What is the fuel regulation for instrument flight?

4. State the minimum ceiling and visibility requirements for instrument flight within and outside control zones.
5. At an alternate airport, what are the minimum ceiling and visibility requirements?
6. Is it ever permissible to take off from a control airport when weather conditions are below the prescribed minimums?
7. If weather reports received by a pilot indicate conditions below the minimums into the airport of destination, what is the pilot to do?
8. What information must be given to the appropriate communication station during an instrument flight?
9. In the event of failure of two-way communication equipment or insufficient radio signals, what must the pilot do?
10. Before submitting a flight plan, what precautionary measures must a pilot take?
11. Is it ever permissible to fly an aircraft under instrument flight rules without submitting a flight plan?
12. What procedure must be followed when a change is made in an approved flight plan?
13. How is the operation of aircraft under instrument flight controlled?
14. State the rule for crossing a civil airway.
15. When must over-the-top flight be governed by instrument flight rules?
16. Explain the meaning of vertical, horizontal, and lateral separation.
17. What flight altitudes must be maintained by aircraft flying along green or red civil airways? Along blue or amber civil airways?
18. Upon landing or completion of an instrument flight made on an approved flight plan, what action is required of the pilot?

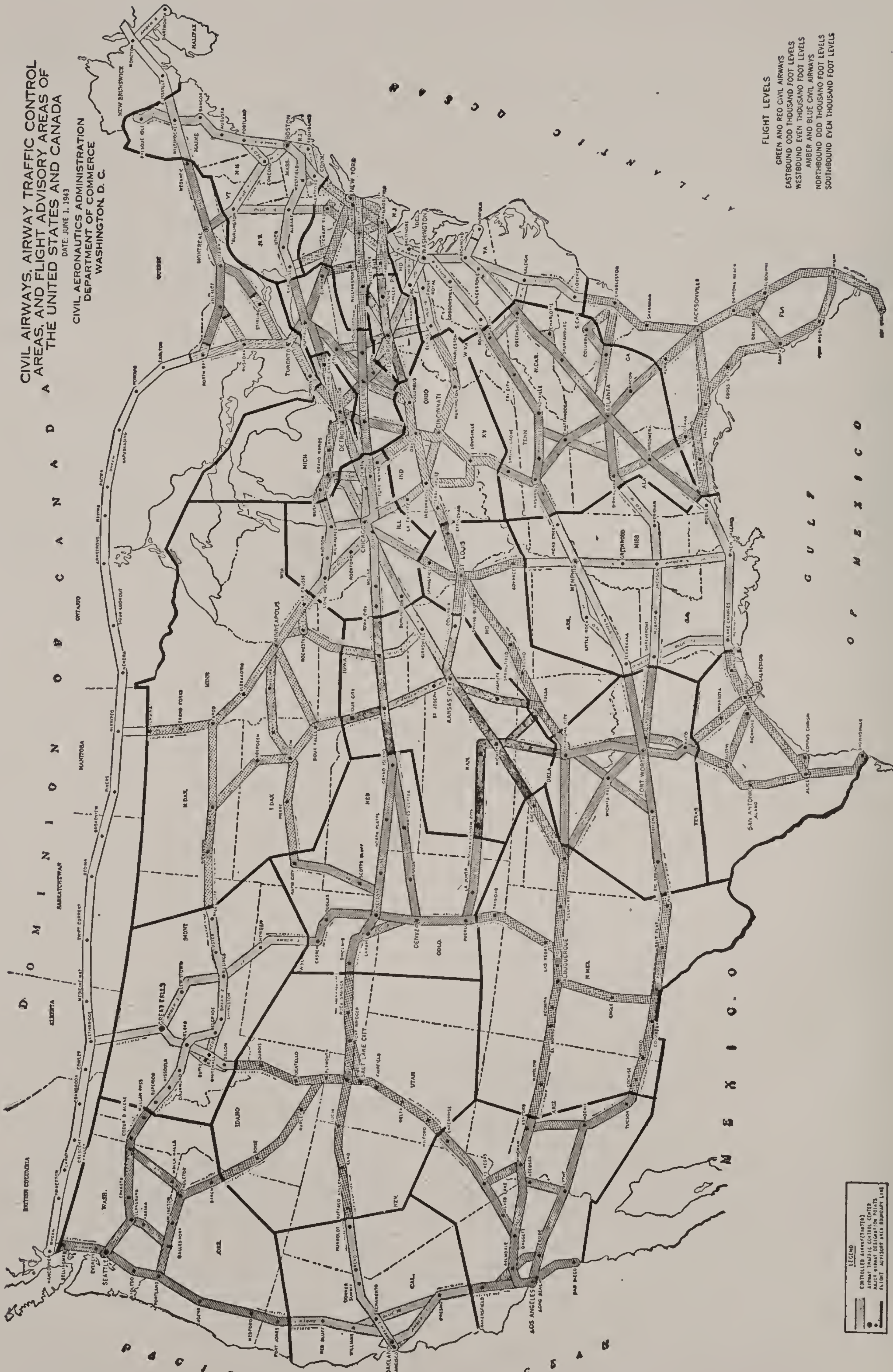

CIVIL AIRWAYS, AIRWAY TRAFFIC CONTROL AREAS, AND FLIGHT ADVISORY AREAS OF THE UNITED STATES AND CANADA
DATE JUNE 1, 1943
CIVIL AERONAUTICS ADMINISTRATION
DEPARTMENT OF COMMERCE
WASHINGTON D. C.
DOMINION OF CANADA
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
PACIFIC OCEAN
FLIGHT LEVELS
GREEN AND RED CIVIL AIRWAYS
EASTBOUND ODD THOUSAND FOOT LEVELS
WESTBOUND EVEN THOUSAND FOOT LEVELS
AMBER AND BLUE CIVIL AIRWAYS
NORTHBOUND ODD THOUSAND FOOT LEVELS
SOUTHBOUND EVEN THOUSAND FOOT LEVELS
LEGEND
CONTROLLED AIRWAY (TINTED)
AIRWAY TRAFFIC CONTROL CENTER
MAJOR AIRWAY DESIGNATION POINTS
FLIGHT ADVISORY AREA BOUNDARY LINE

Figure 17.—Map of civil airways.

Chapter III.—DESIGNATED AREAS

Paths through the navigable air space designated by the Administrator of Civil Aeronautics as Civil Airways and certain portions of such airways designated by the Board form a network which is referred to in many of the Civil Air Regulations. This network will be described in this chapter.

CIVIL AIRWAYS

A civil airway is a path through the navigable air space of the United States, identified by an area on the surface of the earth, designated or approved by the Administrator of Civil Aeronautics as suitable for interstate, overseas, or foreign air commerce. In accordance with the provisions of the Civil Aeronautics Act of 1938, the Administrator has designated certain areas as civil airways.

The airways are designated by naming points on the earth and connecting these points by straight lines. The lines so drawn are called **center lines.** The width of the airway extends, in accordance with the Administrator's order, **5 miles on either side of the center line.** The civil airway includes all of the navigable air space above this area. The map, figure 17, shows the civil airways as of June 1, 1943.

As indicated by figure 17, the airways are named by number and color. The colors used are green, red, amber, and blue. There are, for example, amber civil airway No. 4, extending from Brownsville to Bismarck, and green civil airway No. 4, extending from Los Angeles to Philadelphia. The width of the airway as shown on the map is drawn to an exaggerated scale. The points used in designating the center lines of the civil airways are radio range stations, radio marker stations, or intersections of the center lines of on-course signals. These are discussed in detail in Civil Aeronautics Bulletin No. 24, PRACTICAL AIR NAVIGATION.

AIRWAY TRAFFIC CONTROL AREAS

An airway traffic control area is an area within the limits of a civil airway designated by the Administrator. All air traffic within such area is controlled by an **airway traffic control center** of the Administrator located within the control area.

The airway traffic control centers are indicated by suitable symbols in figure 17. The airway traffic control area is indicated by appropriate shading of that portion of the civil airways. Within such areas the flight of an aircraft is, or may be, continuously controlled through communication facilities, **by Federal personnel.** Outside airway traffic control areas, the supervision of a flight is, to a greater extent, governed by the general rules of the Civil Air Regulations.

FLIGHT ADVISORY AREAS

A flight advisory area is an area designated by the Administrator in which the airway traffic control center gives **flight advisory service** to pilots of aircraft operating on flight plans.

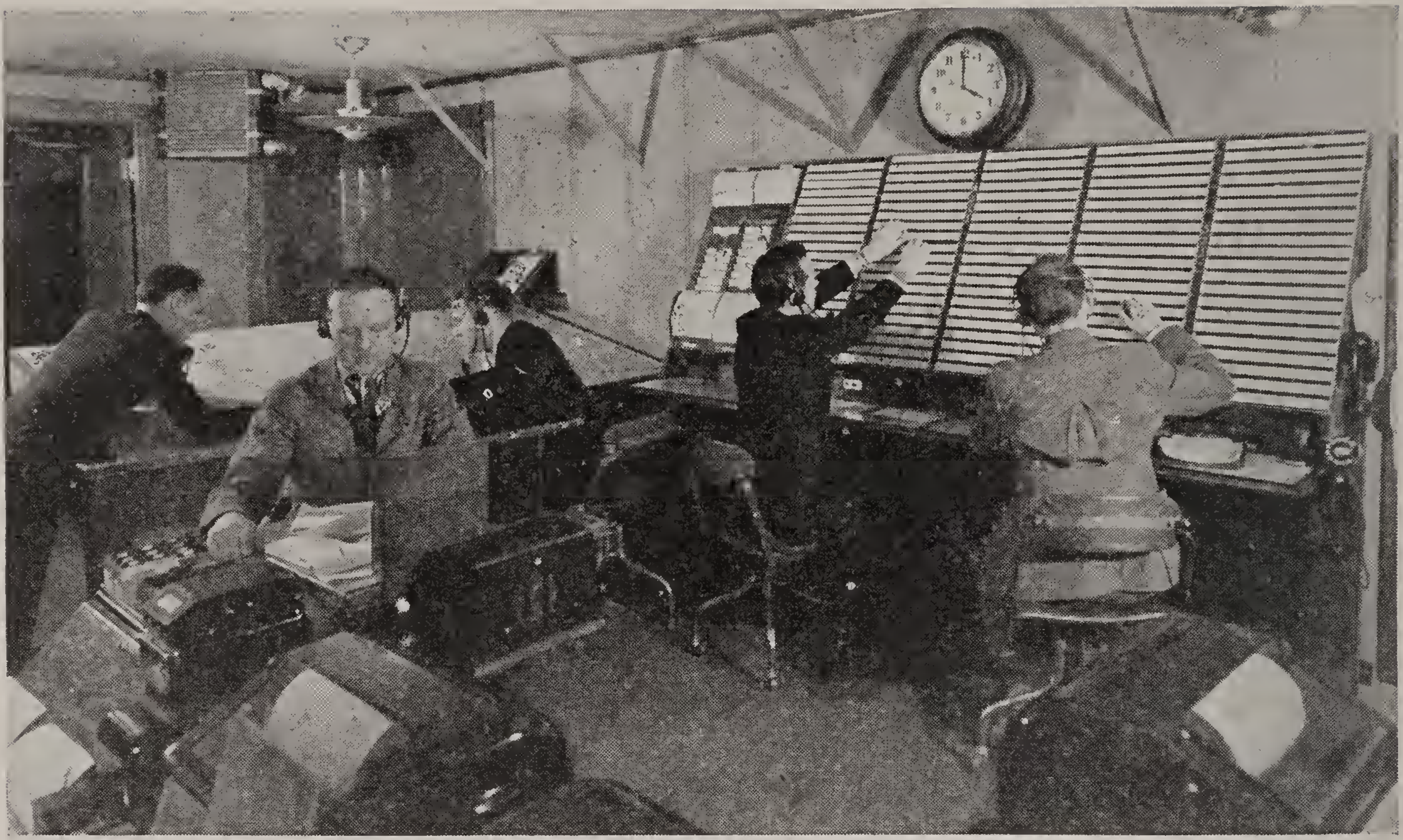
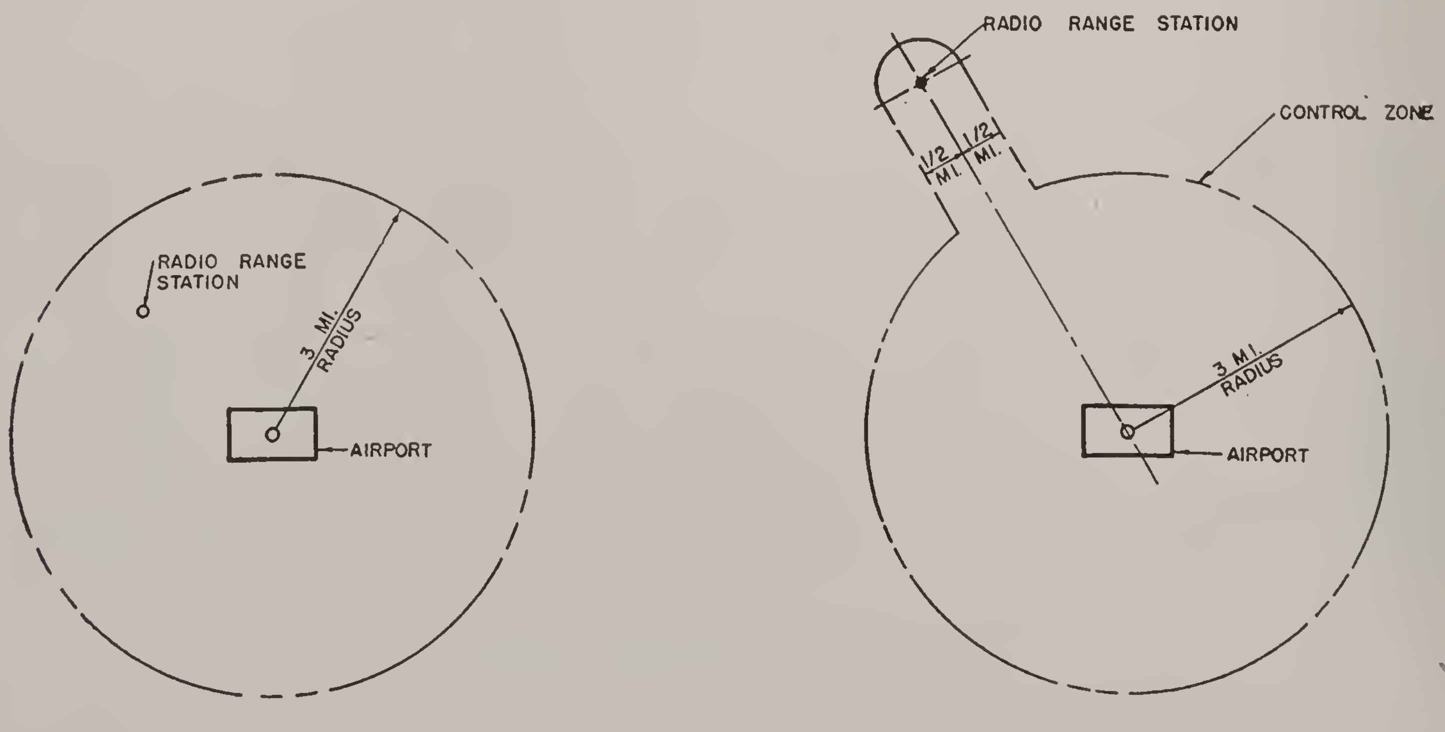


Figure 18.—Interior of a typical airway traffic control center.

CONTROL AIRPORTS AND CONTROL ZONES

A **control airport** is an airport which has been so designated by the Administrator to provide for the safety of aircraft moving in air commerce. A **control zone** is the air space above that area on the surface of the earth within **3 miles** of the center of a control airport, and within **one-half mile** of a line extending from the center of such airport to the radio range station established for the purpose of directing air traffic to such airport. Figure 19 gives a diagrammatic interpretation of the definition of a control zone. There are approximately 150 control airports in the United States. A control airport is not necessarily on a civil airway, but most of them are.



WHERE RADIO RANGE STATION IS LOCATED LESS THAN 3 MILES FROM CENTER OF THE AIRPORT.

WHERE RADIO RANGE STATION IS LOCATED MORE THAN 3 MILES FROM CENTER OF THE AIRPORT.

Figure 19.—Map showing types of control zones.

All aircraft within a control zone must be operated in accordance with traffic control instructions issued by certificated air-traffic control-tower operators of the Administrator on duty at the control airport of such zone.

FLIGHT ZONES

Flight zones may be designated by the Administrator for specific purposes within the local flying area adjacent to any control airport. No person shall make a flight of a type for which a zone has been set apart except within such zone.

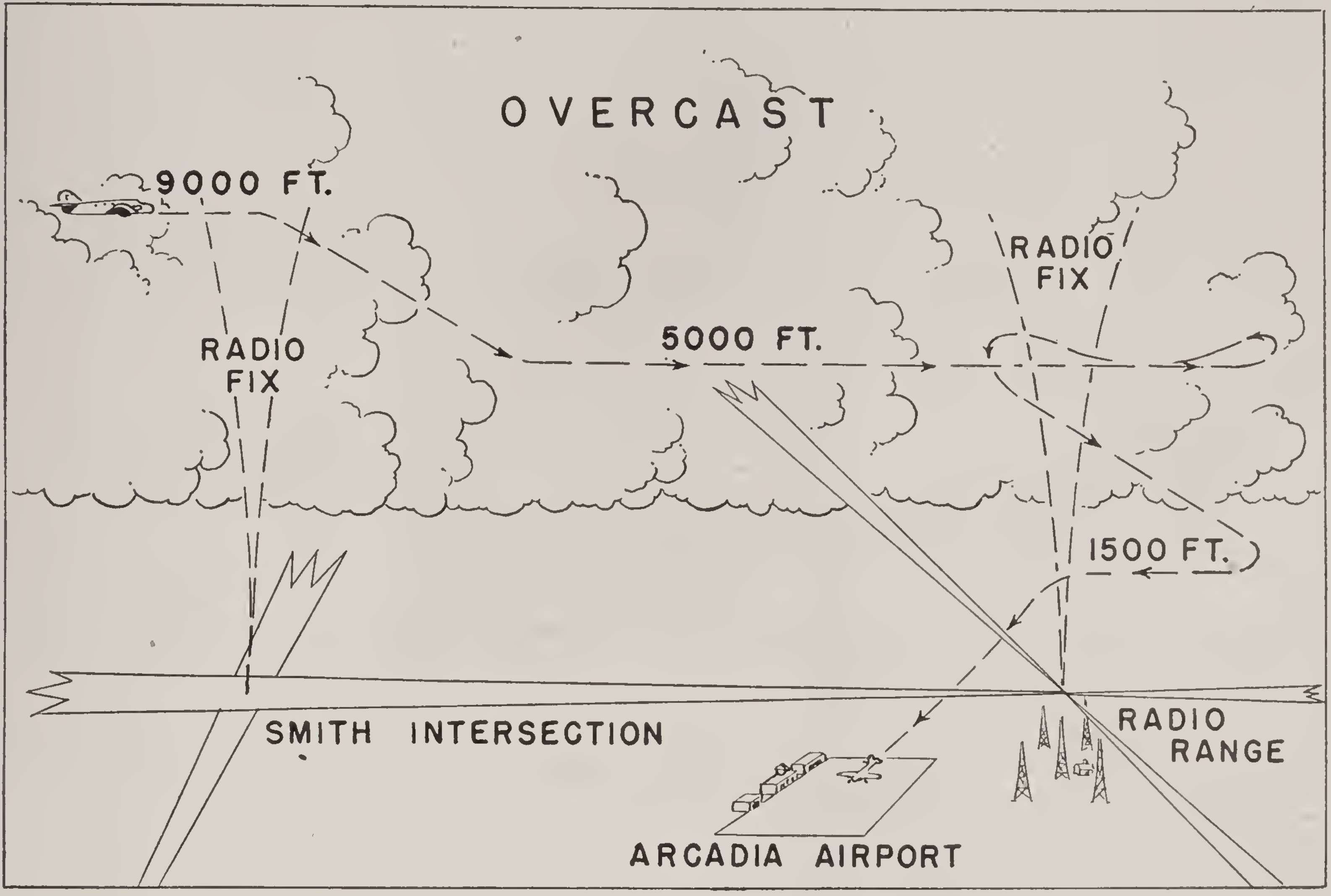


Figure 20.—Aircraft using intersection and range station as radio fixes.

RADIO FIXES

Radio fixes are geographical locations designated by the Administrator on a civil airway above which the position of an aircraft in flight can be accurately determined by means of radio only (such as a cone of silence marker, Z-type marker, fan-type marker, or intersection of radio range on-course signals (60.112).

Radio Range Station

A radio range station is that point in a radio station from which radio signals are emitted for the purpose of assisting an aircraft to maintain a course.

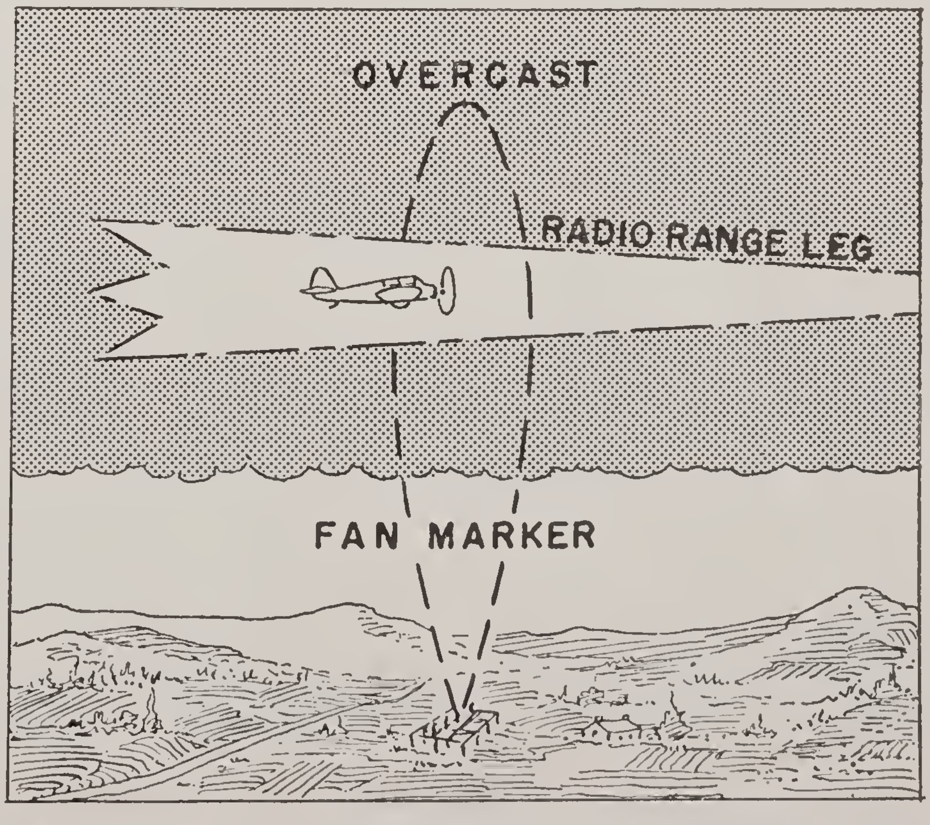


Figure 21.—Aircraft in instrument flight using radio range course and fan marker.

Radio Marker Station

A radio marker station is similar to a radio range station, but is of low power and limited range. It may be located where one radio range station beam intersects or overlaps another or at other points where a "radio fix" is desired.

On-Course Signal

A radio range station, by directional control, projects alternately the code signal for the letter **A** (.—) on one side of the course and the code signal for the letter **N** (—.) on the other side of the course. Where the two signal areas overlap they fuse and produce a steady hum in the radio receiver of the airplane. This steady hum is called the on-course signal.

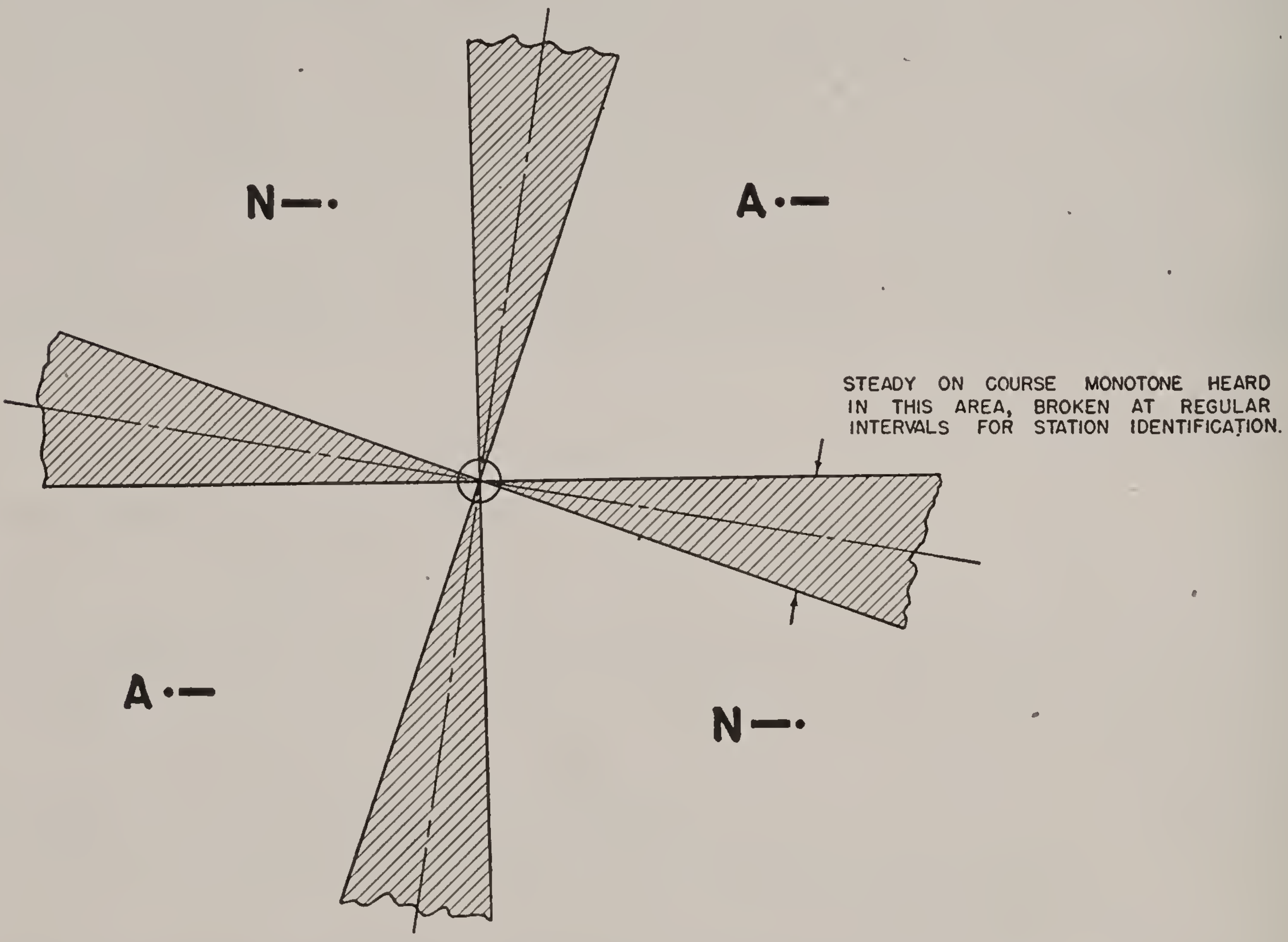

N—·
A·—
STEADY ON COURSE MONOTONE HEARD IN THIS AREA, BROKEN AT REGULAR INTERVALS FOR STATION IDENTIFICATION.
A·—
N—·

Figure 22.—Diagram showing radio range signals.

RANGE APPROACH CHANNEL

A range approach channel is the air space above the ground or water below 17,000 feet above sea level located within 2 miles of either side of the center of the on-course signal of any leg or legs designated by the Administrator of a radio range station serving a control airport, and extending along such leg or legs from such radio range station for a distance of 15 miles: *Provided,* That such range approach channels may be modified or extended by the Administrator when he deems it necessary in the interests of safety.

Unless on an approved flight plan, no person shall fly an aircraft within the limits of a range approach channel above 1,500 feet over the surface of the earth except to enter such a channel on the right side as determined by the proposed direction of flight. No person shall fly an aircraft below 1,500 feet above the surface of the earth within an approach control channel except to cross such channel at an angle of not less than 45°. However, when taking off or landing at a designated landing area located within a range approach channel, a pilot may perform such maneuvers below 1,500 feet as are necessary to effect a normal take-off or approach and landing, as the case may be.

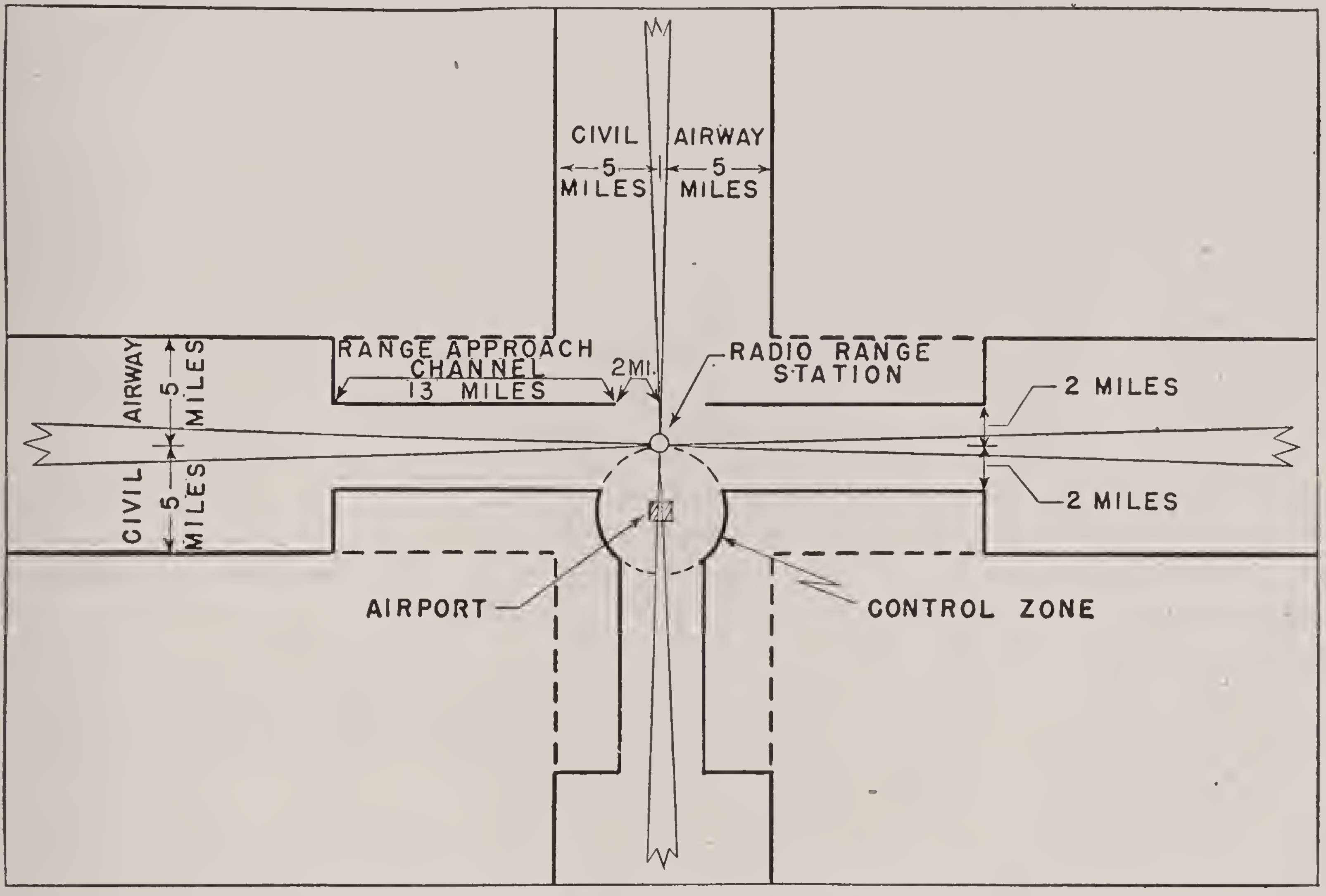


Figure 23.—Radio range approach channels serving a control airport.

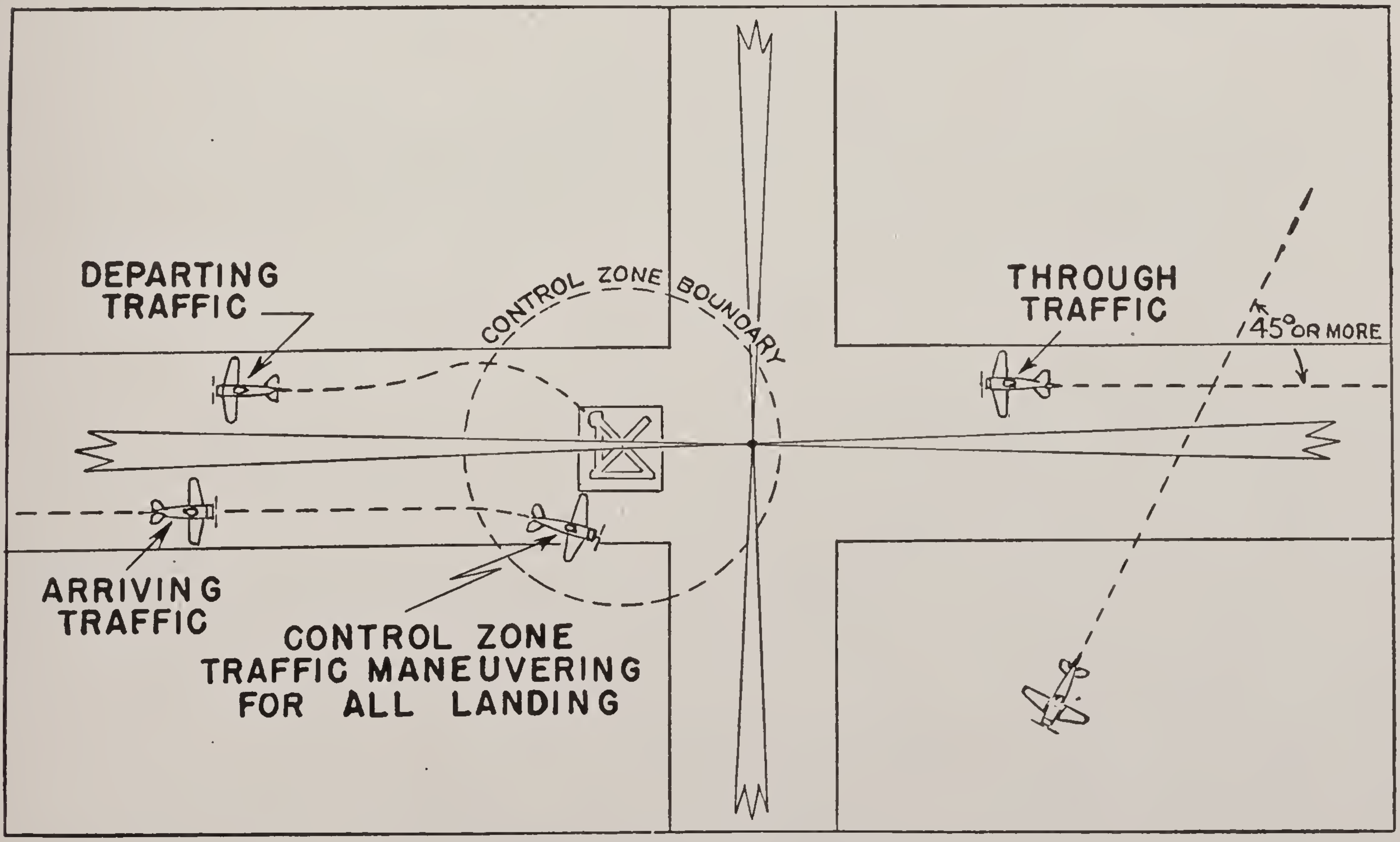


Figure 24.—Flight in range approach.

EMERGENCY AREAS

Certain areas have been designated for specific purposes as follows:

(*a*) *Designated landing area.*—An area designated by the Administrator for the landing and take-off of aircraft during the period of national emergency.

(*b*) *Local flying area.*—An area adjacent to a designated landing area, including any channel leading thereto, which has been set aside by the Administrator, or his authorized representative, for local flying.

(*c*) *Vital defense area.*—An area set aside by the Secretary of War, or the Administrator upon the request or approval of the Secretary of War, within which the operation of aircraft is prohibited or authorized only subject to prescribed conditions.

(*d*) *Zone of military operations.*—An area designated as such by the Secretary of War, or the Administrator upon the request or with the approval of the Secretary of War.

RESTRICTED AREAS

Areas in which the flight of aircraft is prohibited or restricted are classified as caution areas, danger areas, and prohibited areas.

(*a*) *Caution area.*—An area designated by the Administrator in which a visible hazard to aircraft in flight exists and which should be avoided if practicable.

(*b*) *Danger area.*—An area designated by the Administrator in which an invisible hazard to aircraft in flight exists. No flight of aircraft shall be conducted in this area without specific authority issued by the agency having jurisdiction over the danger area.

(*c*) *Prohibited area.*—An area established by Executive Order of the President of the United States. No flight of aircraft shall be made in this area except by aircraft actually engaged in defense missions, or otherwise in accordance with the Executive Order establishing such areas (60.348).

Restricted areas are indicated on aeronautical charts and published in the WEEKLY NOTICE TO AIRMEN.

Review Questions

1. What are civil airways and by whom are they designated?
2. May any area at all be designated as a civil airway?
3. How wide is a civil airway?
4. How are civil airways named?
5. What points are used in designating center lines of civil airways?
6. What is an airway traffic control area?
7. What is a flight advisory area?
8. What is a control airport?
9. Is it necessary for a control airport to be on a civil airway?
10. What is a control zone?
11. How is traffic controlled in a control zone?
12. What is the purpose of a flight zone and where may they be designated?
13. What is the purpose of a radio fix?
14. Explain the difference between a radio range station and a radio marker station.
15. How can a pilot recognize the on-course signal?
16. What is a range approach channel?
17. On which side of a range approach channel should an aircraft enter?
18. When may an aircraft be flown within the limits of a range approach channel above an altitude of 1,500 feet? Below 1,500 feet?
19. Who designates vital defense areas?
20. Define the following: Caution area, danger area, and prohibited area.

Chapter IV.—PILOT REGULATIONS

DISPLAY OF PILOT CERTIFICATE

A pilot's certificate must be kept in the personal possession of the pilot at all times when piloting aircraft, and must be presented for inspection upon request of any passenger, or any authorized officer or employee of the Administrator or Board and of any State or municipal official charged with the duty of enforcing local laws or regulations involving Federal compliance (20.33).

AIRMAN IDENTIFICATION CARD

No pilot shall operate aircraft in flight unless he has in his possession an **airman identification card,** issued by the Administrator, containing his fingerprints, picture, and signature, **or** a **document,** satisfactory to the Administrator, issued by the **Army, Navy, Marine Corps, or Coast Guard,** identifying the pilot as a member thereof (20.37).

OPERATION DURING PHYSICAL DEFICIENCY

A certificated pilot shall not operate any aircraft during the period of any known physical deficiency which would make him during that period unable to meet the physical requirements with which he complied in order to secure his certificate: *Provided, however,* That the holder of at least a private pilot certificate may operate an aircraft otherwise than for hire during the period of a temporary physical deficiency if the aircraft is equipped with fully functioning dual controls and the other control seat is occupied by another pilot who holds at least a private pilot certificate (20.75).

LIQUOR, NARCOTICS, AND DRUGS

No pilot or other member of the crew of an aircraft in flight shall be under the influence of, or use intoxicating liquor, cocaine, or other habit-forming drugs, nor shall such person carry any other person who is obviously under the influence of intoxicating liquor, cocaine, or other habit-forming drugs, except a medical patient under proper care, or in case of emergency (60.345).

LOG BOOKS

Every certificated pilot and every person receiving flying instruction shall keep an accurate record of his flying time in a log book in which the entries with respect to **solo** flying time have been certified to **by him** and the entries with respect to **dual** instruction have been certified to by his certificated **instructor.** Log books must be bound records and the entries must be accurate, legible, in ink or indelible pencil, and so arranged as to facilitate easy reference thereto (20.760).

The log book must contain the date of flight, the make and model of aircraft flown, its type, and, in the case of an airplane, its airplane class and horsepower, the aircraft identification mark, a statement of solo, dual instruction, instrument and night flying time, the duration of the flight, the points between which such flight was made, and, in addition, when any flight results in serious damage to the aircraft, a notation to this effect. Flying instruction time must be logged in the same manner and, in addition, the instructor must make complete entries in the log book of his student showing the nature of each maneuver in which instruction was given and the time spent thereon. The instructor must attest each such entry with his initials, pilot certificate number, and pertinent rating. A log book must be presented for inspection, upon request and reasonable notice, to any authorized representative of the Administrator or Board or State or municipal officer enforcing local regulations or laws involving Federal compliance (20.761).

LOGGING OF PILOT FLIGHT TIME

Student Pilot

The holder of a student pilot certificate may log as solo flight time only that time during which he is the sole occupant of an aircraft in flight.

Pilots of Private Grade or Higher

The holder of a pilot certificate, other than a student pilot certificate, may log as solo flight time that portion of any flight during which he is the sole manipulator of the controls: *Provided,* That he may log as solo flight time only 50 percent of any flight time during which a certificated instructor or a certificated air line transport pilot is in the aircraft serving as an instructor for the purpose of reviewing or increasing such pilot's skill: *And provided further,* That the holder of a commercial pilot certificate while serving in scheduled air transportation shall log his flight time as provided in Part 61.

Flight Instructor

A certificated instructor may log as solo flight time all that flight time during which he is serving as an instructor for the purpose of reviewing or increasing another pilot's skill.

Instrument

Instrument flight time may be logged as such only when the aircraft is flown solely by reference to instruments whether under actual or properly simulated flight conditions. (**Over-the-top flying** shall not be logged as instrument flight time) (20.762).

FLIGHT INSTRUCTOR REQUIREMENTS

Rating

No person may give flying instruction to any other person unless he possesses at least a valid commercial pilot certificate and a valid flight instructor rating, or, in case of instruction to glider students, unless possessed of a valid commercial glider pilot certificate: *Provided, however,* That the holder of a valid private pilot certificate and a valid instructor rating may give flying instruction not for hire (20.80).

Instruction Time Limitation

No flight instructor may give more than 36 hours of dual flying instruction or check time in any 7-day period (20.82).

DUAL CONTROL INSTRUCTION

No flight instruction shall be given unless the aircraft in which the instruction is given is equipped with fully functioning dual controls, except in aircraft manufactured prior to January 1, 1939 (20.81).

DUAL CONTROL AIRPLANES

Airplanes equipped with fully or partially functioning dual controls may not be operated with both control seats occupied unless one of such control seats is occupied (*a*) by a person possessing at least a valid commercial pilot certificate, or (*b*) by a person possessing at least a valid private pilot certificate and a valid instructor rating, or (*c*) by a person possessing at least a valid private pilot certificate and whose Airman Rating Record has been endorsed by a duly authorized representative of the Administrator to the effect that such person has logged at least 200 hours of solo flight time and is competent to exercise the privilege granted by this section: *Provided*, That two persons may occupy such control seats if each such person possesses at least a valid private pilot certificate: *Provided further*, That where more than one passenger is carried for hire neither control seat may be occupied by any person other than a properly certificated commercial pilot (20.724).

INSTRUMENT INSTRUCTION

Instrument instruction in flight is not deemed flying instruction within the meaning specified, but no person may give instrument instruction in flight unless he possesses a valid instrument rating (20.83).

SIMULATED INSTRUMENT FLIGHT

No person shall operate an aircraft under simulated instrument flight conditions unless:

(*a*) fully functioning dual controls are installed in the aircraft;

(*b*) a properly certificated pilot occupies the other control seat as safety pilot; and

(*c*) such safety pilot at all times has adequate vision from the aircraft: *Provided*, That if the vision of the safety pilot forward or to either side of the aircraft is obstructed, a competent observer must occupy such a position in the aircraft that his field of vision adequately supplements that of the safety pilot.

(*d*) Notwithstanding provisions of (*a*), (*b*), and (*c*) of this section, a member of the Armed Forces of the United States may operate single-place aircraft in simulated instrument flight: *Provided*, such flights shall be made only during the hours of daylight, in accordance with contact flight rules: *And provided further*, each such aircraft is accompanied by and under the continuous control by radio of a competent observer in an escort aircraft (20.725).

REQUIREMENTS FOR FIRST SOLO

Three-Control Airplanes of Traditional Type

No first solo flight shall be made by a student pilot in a three-control airplane of traditional type until he shall have had a minimum of 8 hours of dual instruction in such aircraft, including recovery from spins and stalls.

Three-Control Nonspinnable Airplanes

No first solo flight shall be made by a student pilot in a nonspinnable three-control airplane until he shall have had a minimum of 8 hours of dual instruction in three-control airplanes. Instruction in spins is not required.

Two-Control Nonspinnable Airplanes

No first solo flight shall be made by a student pilot in a two-control nonspinnable airplane with **nose wheel type landing gear** until he shall have had a minimum of 5 hours of dual instruction in such airplanes.

In addition to meeting the above requirements, a student pilot shall not make a first solo flight unless his instructor deems him competent to make such flight and so certifies on the student pilot certificate in the provided space (20.7200).

RESTRICTIONS AFTER FIRST SOLO

Upon completion of a student pilot's first solo flight, his instructor shall make a notation to that effect on the student pilot certificate, together with a statement of the date, the type, and, in the case of an airplane, the airplane class and horsepower range of the aircraft so flown. If such solo flight is made either in a two-control nonspinnable airplane with nose wheel type landing gear or in a three-control airplane determined to be characteristically incapable of spinning, the instructor shall also make an appropriate notation to that effect. Thereafter—

(*a*) If such first solo flight was made in a **three-control airplane of traditional type,** the student shall not solo aircraft of a different type, class or horsepower range until such time as his instructor shall deem him competent to fly such other aircraft solo, and shall have made a notation to that effect on his certificate, together with the date, type, and, in the case of an airplane, the class and horsepower range.

(*b*) If such first solo flight was made in a **three-control airplane** determined to be characteristically **incapable of spinning,** such pilot shall be subject to the limitations of paragraph (*a*) above, and in addition, he shall not solo an airplane characteristically capable of spinning until after he shall have received dual instruction in spins, and a notation to that effect has been made on his Airman Rating Record.

(*c*) If such first solo flight was made in a **two-control nonspinnable airplane with nose wheel type landing gear,** such pilot shall be subject to the limitations of paragraphs (*a*) and (*b*) above, and in addition, prior to flying solo a three-control airplane, shall have received a minimum of 4 hours of dual instruction in such airplanes (20.7201).

STUDENT PILOT FLIGHT AREA LIMITATIONS

(*a*) No student pilot shall make a solo flight outside of an area, in the vicinity of the operating base of his instructor, prescribed in writing by the person directly in charge of the landing area on which the instructor's operating base is located and approved by the local inspector of the Administrator, unless such student pilot has been certified for cross-country solo flights.

(*b*) No student pilot shall be certified for cross-country solo flight until after he shall have logged 8 hours' solo flight time and his instructor shall have certified on his student pilot certificate, in the space provided, that he deems the student competent to make such flight.

No student pilot certified for cross-country solo flights shall make a solo flight outside of the area, within a 150-mile radius of the operating base of his instructor, prescribed in writing by the person directly in charge of the landing area on which the instructor's operating base is located and approved by the local inspector of the Administrator: *Provided,* That a certificated flying school may prescribe in writing an area within a 250-mile radius of its operating base and, upon approval of said area by the local inspector of the Administrator, a student pilot enrolled in the flight curriculum of said school and certified for cross-country solo flights may fly solo within such area at the direction of said flying school.

(*c*) No person shall operate an aircraft in solo flight outside the flight area specified in his pilot certificate or Airman Rating Record.

(*d*) Flight area designations submitted to the local inspector under subsections (*a*) and (*b*) hereof shall be deemed approved by him unless the person submitting the designations is otherwise notified by the inspector within 15 days from the date of submission.

FLIGHT LIMITATIONS

(*a*) *Student.*—**A student pilot shall not operate aircraft for hire or carry anyone other than a certificated instructor.** A student pilot who has not flown an aircraft within 90 days shall not operate aircraft in solo flight until he has passed a satisfactory flight check given by a certificated instructor and that fact has been endorsed on his student pilot certificate (20.720).

(*b*) *Private pilot.*—A person possessed of a valid private pilot certificate shall not pilot for hire any aircraft carrying any person or property; nor pilot any aircraft in furtherance of a business except as an incident to his personal transportation: *Provided,* That this section shall not prevent such pilot from receiving remuneration by direction of the Government of the United States, or of any State or political subdivision thereof, for participation in official missions of the Civil Air Patrol or of any other recognized semimilitary organization, while a member of such organization (20.721).

(*c*) *Commercial pilot.*—A person possessed of a valid commercial pilot certificate shall not pilot any aircraft carrying any person or property in scheduled air transportation service unless also possessed of a valid instrument rating (20.722).

Grounds for Elimination of Trainees

Flights not under the supervision of an approved flight instructor or flights in an unassigned airplane are grounds for the elimination of any trainee in the CAA War Training Service Program.

Review Questions

1. When a pilot operates an aircraft, what personal identification must he have in his possession?
2. Is a student pilot required to carry his pilot certificate with him when receiving dual instruction?
3. Is it ever possible for a pilot to operate an aircraft without an airman identification card?
4. If a certificated pilot has any known physical deficiency which would make him unable to meet the physical requirements, may he operate an aircraft?
5. What should a pilot do if after taking off he finds that a passenger has with him intoxicating liquor?
6. Under what conditions must entries with respect to flying time be certified by a certificated instructor? Who certifies entries with respect to other flying time?
7. How does the instructor attest entries of flight instruction time in a trainee's log book?
8. Who must make the entries on flight instruction time in a trainee's book?

9. May a student pilot log as solo flight time that time in which he is receiving dual instruction?
10. Is it possible for the holder of a valid private pilot certificate and instructor rating to give flying instruction?
11. May a flight instructor give 40 hours of dual flying instruction or check time in a 7-day period?
12. Under what conditions may a dual-control airplane be operated with dual controls fully or partially functioning and both control seats occupied?
13. What provisions have been made for aircraft operating under simulated instrument conditions?
14. What requirements must be met before a student pilot may make his first solo flight?
15. If a student pilot makes his first solo flight in a three-control airplane, may he solo a three-control airplane of traditional type?
16. What is the area limitation for solo cross-country flight by a student pilot?
17. What experience is required before a student pilot may make a cross-country solo flight?
18. May a student pilot operate an aircraft for hire?
19. May a student pilot operate an aircraft carrying passengers not for hire?
20. May a private pilot operate an aircraft carrying passengers not for hire?
21. What provision has been made for private pilots participating in official missions of the Civil Air Patrol?
22. What specific limitations apply to CAA War Training Service trainees?

Chapter V.—CERTIFICATION OF PILOTS

NECESSITY FOR PILOT CERTIFICATES

It is unlawful—

(*a*) for any person to serve in any capacity as an airman in connection with any civil aircraft used in air commerce without an airman certificate authorizing him to serve in such capacity, or in violation of the terms of any such certificate;

(*b*) for any person to employ for service in connection with any civil aircraft used in air commerce an airman who does not have an airman certificate authorizing him to serve in the capacity for which he is employed.

"Air commerce" means interstate, overseas, or foreign air commerce or the transportation of mail by aircraft or any operation or navigation of aircraft within the limits of any civil airway or any operation or navigation of aircraft which directly affects, or which may endanger safety in, interstate, overseas, or foreign air commerce. (Civil Aeronautics Act of 1938, title I, sec. 1 (3), and title VI, sec. 610 (a) (2, 3).

However, the Civil Aeronautics Board has declared that any operation of aircraft in the air space overlying the United States either directly or indirectly affects, or may endanger safety in, interstate, overseas, or foreign air commerce (amendment 135).

Consequently, no person shall pilot civil aircraft in the United States unless such person holds a valid pilot certificate or an effective foreign pilot certificate validated by the Administrator. However, any person may operate the controls of an aircraft if the aircraft is equipped with fully functioning dual controls and one of the control seats is occupied by a person holding an appropriate pilot certificate (60.30).

GRADES OF PILOT CERTIFICATES

The Administrator issues various pilot certificates which indicate the aeronautical qualifications of the holders and specify the capacity in which the holders are authorized to serve in connection with aircraft.

Aircraft pilot certificates, other than glider or lighter-than-air, are classified in the following ascending grades:

(1) Student pilot certificate.
(2) Private pilot certificate.
(3) Commercial pilot certificate.
(4) Airline transport pilot certificate (provided for in all respects in Part 21 of the Civil Air Regulations).

Glider pilot certificates are classified in the following ascending grades:

(1) Student glider pilot certificate.
(2) Private glider pilot certificate.
(3) Commercial glider pilot certificate.

Lighter-than-air pilot certificates are provided for in all respects in Part 22 of the Civil Air Regulations.

REQUIREMENTS FOR PILOT CERTIFICATES

Glider Pilot Certificates

The requirements for the various grades of glider pilot certificates are given in sections 20.15 to 20.178 of the Civil Air Regulations.

Aircraft Pilot Certificates

The requirements for student, private, and commercial pilot certificates are given in Table A on pages 41–43.

Exceptions for Commercial Pilot Certificate

Certain of the procedures required for the original issuance of commercial pilot certificates are impracticable and unnecessary in the case of students completing **certain combinations** of **courses given under** the **Civil Aeronautics Administration** and **by scheduled air carriers.** Finding it necessary for the successful prosecution of the war effort to make a special regulation to meet this need, the following regulation was promulgated:

Notwithstanding the provisions of Part 20 of the Civil Air Regulations to the contrary, a commercial pilot certificate with proper ratings may be issued to pilots who submit evidence of having satisfactorily complied with the provisions concerning age, character, citizenship, education, physical condition, aeronautical knowledge, and aeronautical skill required for a commercial pilot certificate, and the provisions concerning aeronautical knowledge, aeronautical skill, and radio skill for an instrument rating, and have not less than **150 hours** of **flight time,** including an instrument flight course, accumulated in courses under either the Civil Aeronautics Administration or a scheduled air carrier operator, and in addition shall successfully have accomplished a transition flight training course on multi-engine equipment of not less than 10 hours as follows:

(*a*) a minimum of 10 take-offs and landings, of which at least three shall be at night;

(*b*) take-offs and landings with various loads and various positions of center of gravity;

(*c*) landings with various flap settings;

(*d*) cross-wind landings;

(*e*) simulated power failure; including single-engine approaches;

(*f*) single-engine climbing and circling;

(*g*) simulated instrument flight, including maneuvers on instruments, radio range flying; orientation;

(*h*) power on, power off stalls;

(*i*) demonstration of competence in cockpit procedure and ability to relieve the first pilot of routine responsibilities in connection with the handling of communications (Regulation Serial No. 242).

TABLE A.—Requirements for Certification

	Student pilot certificate.—To be eligible for a student pilot certificate, an applicant shall comply with the following requirements—	**Private pilot certificate.**—To be eligible for a private pilot certificate, an applicant shall comply with the following requirements—	**Commercial pilot certificate.**—To be eligible for a commercial pilot certificate, an applicant shall comply with the following requirements—
Age	Applicant shall be at least 16 years of age. If applicant be less than 21 years of age at the time of making application, he shall submit with his application the written consent of either parent, or legal or natural guardian to the issuance of the pilot certificate sought. If applicant is a regular or reserve member of Armed Forces at time of making application, no written consent is necessary for duration of war.	Same as for student certificate except that applicant shall be at least 18 years of age.	Same as for private certificate.
Character	Applicant shall be of good moral character	Same as for student certificate	Same as for student and private certificates.
Citizenship	Applicant shall be: (a) A citizen of and of unquestionable loyalty to the United States, or (b) A person who is in sympathy with the objectives of the United States, and who is a trustworthy citizen of a friendly foreign government not under the domination of or associated with any government with which the United States is at war.	Same as for student certificate	Applicant shall be: (a) A citizen of and of unquestionable loyalty to the United States, or (b) A person who is in sympathy with the objectives of the United States and who is a trustworthy citizen of a friendly foreign government not under the domination of or associated with any government with which the United States is at war and which government grants reciprocal commercial pilot privileges to citizens of the United States on equal terms and conditions with citizens of such foreign government, or (c) A person who is in sympathy with the objectives of the United States and who is a trustworthy citizen of a friendly foreign government not under the domination of or associated with any government with which the United States is at war. The effectiveness of the certificate issued to such person shall in any event terminate 6 months after the war and may be terminated by the Administrator at any time without notice. Upon application to the Administrator, the war limitation clause may be removed whenever the government of the country of which he is a citizen grants the reciprocity required in (b) of this section.
Education	If an applicant is unable to read, speak, and understand the English language, appropriate operation limitations may be entered upon his student pilot certificate.	Applicant shall be able to read, speak, and understand the English language. A citizen of Puerto Rico may not be compelled to meet these requirements but in any such case appropriate operation limitations may be entered upon his Airman Rating Record.	Applicant shall be able to read, speak, write, and understand the English language.

TABLE A.—Requirements for Certification—Continued

	Student pilot certificate.—To be eligible for a student pilot certificate, an applicant shall comply with the following requirements—	**Private pilot certificate.**—To be eligible for a private pilot certificate, an applicant shall comply with the following requirements—	**Commercial pilot certificate.**—To be eligible for a commercial pilot certificate, an applicant shall comply with the following requirements—
Physical condition	Applicant shall meet the physical standards prescribed for Class III airmen in Part 29 of the Civil Air Regulations. Exceptions to physical standards: An airman certificate may be issued to an applicant who does not meet the appropriate physical standards if, in the opinion of the Administrator, his aeronautical experience, ability, and judgment compensate for his physical deficiency. A medical certificate issued under these conditions may be limited as to type of operation, type of aircraft, or period of reexamination: *Provided*, That the provisions of this section shall not apply to applicants for the original issuance of an airline transport pilot certificate. Military personnel on active or reserve status assigned by the Army, Navy, Marine Corps, or Coast Guard of the United States for pilot training to the CAA War Training Service shall be deemed to have met such requirement. Such trainees may pilot aircraft without certificates only during period they are receiving student training from CAA War Training Service. Regulation is effective for duration and 6 months thereafter.	Applicant shall meet the physical standards prescribed for Class III airmen in Part 29 of the Civil Air Regulations. Exceptions to physical standards: An airman certificate may be issued to an applicant who does not meet the appropriate physical standards if, in the opinion of the Administrator, his aeronautical experience, ability, and judgment compensate for his physical deficiency. A medical certificate issued under these conditions may be limited as to type of operation, type of aircraft, or period of reexamination: *Provided*, That the provisions of this section shall not apply to applicants for the original issuance of an airline transport pilot certificate.	Applicant shall meet the physical standards prescribed for Class II airmen in Part 29 of the Civil Air Regulations. Exceptions to physical standards: Same as for private pilot certificate.
Aeronautical knowledge	No requirement is prescribed but, prior to his first solo flight, applicant shall demonstrate thorough familiarity with the provisions of Part 60 of the Civil Air Regulations dealing with contact flight by satisfactorily accomplishing a written examination on such provisions, and such fact shall be certified to by his instructor.	Applicant shall be familiar with and accomplish satisfactorily a written examination covering so much of the provisions of Parts 01, 20, and 60 of the regulations as are pertinent to his certificate, prevailing weather conditions in the United States as encountered in flying, and the forecasting thereof, the analyzing of weather maps and sequence reports as furnished by the United States Weather Bureau, practical air navigation problems and the use of maps, navigation by terrain (pilotage) and by dead reckoning, including the use of instruments and other aids to navigation in visual contact flying, and the general servicing and operation of aircraft.	Same as for private certificate except that the examinations will be more searching and in greater detail. In addition, applicant shall satisfactorily accomplish a written examination on the theory and the practice of flight and the maintenance of aircraft, and on the maintenance and proper use of aircraft power units in common use.
Aeronautical experience	No requirement.	Applicant shall have logged at least 35 hours of solo flight time: *Provided*, That an applicant seeking a rating limited to two-control nonspinnable airplanes with nose wheel type landing gear shall have logged at least 25 hours of solo flight time. As part of the foregoing applicant shall have logged at least 5 hours within the 60 days immediately preceding the date of filing the application, and at least 5 hours of cross-country flying of which at least 3 hours shall be solo, which shall include at least one flight over a course of not less than 50 miles with at least two full-stop landings at different points along the course. Such experience shall be certified to by some person, other than the applicant, having direct knowledge thereof. A graduate of the private pilot course of	Applicant shall have logged at least 200 hours of solo flight time, of which at least 5 hours shall have been logged within the 60 days immediately preceding the date of filing the application. As part of the foregoing, applicant shall have logged at least 10 hours of solo cross-country flying, which shall include at least one flight over a course of not less than 100 miles with at least three full-stop landings at different points on such course. Such experience shall be certified to by some person, other than the applicant, having direct knowledge of the same. However, a graduate of a commercial pilot course of a certificated flying school shall be

		a certificated flying school will be deemed to have met the above requirements upon presentation of his certificate of graduation within 30 days thereof.	deemed to have met the requirements of this section upon presentation of his certificate of graduation within 30 days thereof.
Aeronautical skill	No requirement is prescribed	Applicant shall satisfactorily demonstrate his ability to pilot aircraft in solo flight and, in addition to normal take-offs, turns, and landings, to perform satisfactorily the following maneuvers: (a) A series of three landings from an altitude not to exceed 1,000 feet, with engine throttled and a 180° turn, the aircraft touching the ground in normal landing attitude beyond and within 300 feet of a line or point designated by the examining inspector for the Administrator. (b) A spiral in each direction of not less than three full turns, in a banked attitude of not less than 60°, with engine throttled. (c) The following three maneuvers: (1) 3 shallow figure 8's either "on pylon" or "around pylon"; (2) 3 steep figure 8's either "on pylon" or "around pylon"; and (3) 1 720° power turn in each direction in a banked attitude of at least 60°. During each of these maneuvers the total variation in altitude shall not exceed 200 feet. (d) A right-hand and a left-hand spin, each of at least 1 full turn. (e) Coordination exercises, straight climbs, climbing turns, slips and emergency maneuvers such as simulated forced landings, recovery from stalls entered from both level and steeply banked attitudes, and such other maneuvers as the examining inspector for the Administrator may deem necessary and appropriate to demonstrate the competency of the applicant for the certificate or rating sought.	Same as for private certificate except as follows: (a) In the accuracy landing maneuvers, the aircraft shall touch the ground within 200 feet beyond the line or point designated. (b) In the figure 8 and 720° turn maneuvers, the pilot shall not gain or lose more than 100 feet. (c) In the spins, the applicant shall perform a two-turn spin in each direction with an error of not more than plus or minus 10 degrees.
Military competence		An applicant, who within the preceding 60 days has been on active duty with flying status for a period of not less than 6 months as a member of the Army, Navy, Marine Corps, or Coast Guard of the United States, or the armed service of any government allied with the United States, shall be deemed to have met the aeronautical knowledge, experience and skill requirements of the Civil Air Regulations for the issuance of a pilot certificate of appropriate type and grade: (a) if he submits to an inspector of the Administrator written proof of an honorable discharge or return to inactive reserve status together with a certificate from the appropriate military officer in charge of flying showing that the applicant was, at the time of separation from the service, on solo flying status as a rated military pilot; and setting forth the pilot rating held by him and the type, class, and horsepower of aircraft he had been found competent to pilot; (b) if the requirements for the military pilot rating held are at least equivalent to the requirements of the Civil Air Regulations for the type and grade of pilot certificate sought; and (c) if he passes the written examination on the Civil Air Regulations required of applicants for the type and grade of certificate sought.	Same as for private certificate.

AIRMAN RATING RECORD

Attached to each pilot certificate, except a student pilot certificate, is an Airman Rating Record which contains such items as type, class and horsepower ratings, special ratings, and flight area limitations.

Pilot Aircraft Ratings

1. *Aircraft type rating.*—For purposes of specifying the type of aircraft which the applicant is deemed competent to pilot and for convenience in examining and rating the applicant with respect thereto, aircraft are typed as follows:

(*a*) Airplane;
(*b*) Autogiro;
(*c*) Glider;
(*d*) Lighter-than-air aircraft.

2. *Airplane class rating.*—For purposes of specifying the class of airplane which the applicant is deemed competent to pilot and for convenience in examining and rating the applicant with respect thereto, airplanes are classed as follows:

(*a*) Single-engine, land;
(*b*) Single-engine, sea;
(*c*) Multi-engine, land;
(*d*) Multi-engine, sea;
(*e*) Unconventional.

3. *Horsepower rating.*—For purposes of specifying the horsepower of airplanes which the applicant is deemed competent to pilot and for convenience in examining and rating the applicant with respect thereto, pilots are rated as follows:

(*a*) A certificated pilot is rated to fly airplanes of 80 or less horsepower if competence has been demonstrated in airplanes certificated for a maximum, except take-off, of 80 or less horsepower.

(*b*) Except where subsection (*a*) is applicable, a certificated pilot is rated to fly airplanes of a range of horsepower extending from 50 percent less to 50 percent greater than the total maximum, except take-off horsepower for which the airplanes in which competency was demonstrated were certificated.

(*c*) A certificated pilot eligible for two or more horsepower range ratings shall be rated for one continuous range extending from the lowest to the highest horsepower for which he has qualified.

4. *Multiple airplane class and horsepower ratings.*—The horsepower rating shall apply to all airplane class ratings without the necessity of a separate flight test in each combination of such ratings. An applicant who has demonstrated competence in both single- and multi-engine airplanes and in both land and sea airplanes may be rated for all airplane classes except unconventional.

Special Pilot Ratings

There are two special pilot ratings as follows:

(1) Flight Instructor rating.
(2) Instrument rating.

A notation of any special ratings which a pilot may hold is entered on the Airman Rating Record attached to his certificate.

NOTE: For example, a pilot may be rated under (2) for single-engine land airplanes and under (3) (a) and (b) for 180 or less horsepower by reason of flight tests in land planes of 50 horsepower and 120 horsepower. If he subsequently passes a rating flight test in a multi-engine seaplane of 450 horsepower, he will be rated under (2) for *single- or multi*-engine land or sea airplanes, and therefore, will be eligible to fly single- or multi-engine *land or sea* airplanes of 675 or less horsepower.

TABLE B.—Special Rating Requirements

	Flight Instructor rating. To be eligible for an instructor rating, an applicant shall comply with the following requirements—	**Instrument rating.** To be eligible for an instrument rating, an applicant shall comply with the following requirements—
Age	Same as for private certificate	
Aeronautical knowledge	Applicant shall have practical and theoretical knowledge of flight instruction and shall accomplish a satisfactory written and practical examination thereon.	Applicant shall be familiar with the use of such instruments and other navigational aids, both in aircraft and on the ground, as are deemed by the Administrator to be necessary for the navigation of aircraft by instruments, and with meteorology as applied to weather analysis and forecasting, and the applicant shall satisfactorily accomplish a written examination thereon.
Aeronautical experience	Applicant shall be possessed of a valid commercial or private pilot certificate. In the latter case, he must meet the experience requirements for the commercial certificate.	Applicant shall be possessed of a valid private or commercial pilot certificate, and shall have logged at least 200 hours of solo flight time as prescribed for a commercial certificate, including at least 20 hours of instrument instruction and practice under actual or simulated flight conditions approved by the Administrator: Provided, That not less than 10 hours of such 20-hour requirement shall be in actual flight.
Aeronautical skill	Applicant shall satisfactorily accomplish a practical flight test as to his ability to perform with precision and teach properly such fundamental flight maneuvers as are, in the opinion of the Administrator, deemed necessary and appropriate for safe and sound instruction in the safe piloting of aircraft.	Applicant shall satisfactorily accomplish, solely by instruments, a flight test with respect to the following: (a) Straight level flight for a given period of time. (b) Moderately banked 180° and 360° turns in both directions. (c) Minimum glides and maximum climbs, and approaches to stalled attitudes of flight. (d) Climbing turns. (e) Stalls, skids, slips and spirals, and banks in excess of 45°, and recovery from the same. (f) Such other maneuvers as the examining inspector deems necessary (g) A practical demonstration, while in flight or under simulated conditions, of estimating arrival time, taking into account speed, wind, and drift.
Radio skill		Applicant shall satisfactorily accomplish, solely by instruments, a flight test with respect to the following: (a) Tuning radio. (b) Orientation. (c) Following radio range. (d) Locating cone of silence. (e) Letting-down-through on the range by the approved instrument approach procedure for the particular airport used in connection with the test. (f) Such other maneuvers as the inspector deems necessary.
Military Instrument competence.		An applicant who holds a valid instrument rating issued by the Army, Navy, Marine Corps, or Coast Guard, and who holds a commercial pilot certificate may be issued an instrument rating valid only for piloting air carrier aircraft as a second pilot.

EXAMINATIONS AND TESTS

The examinations and tests prescribed in this chapter (both for pilot certificates and for the ratings issued with respect thereto) are conducted by an authorized officer or employee of the Administrator or by a properly qualified person designated for the purpose by the Administrator (20.60).

Time and Place

All examinations and tests will be held at such times and places as the Administrator or his representative may designate (20.64).

Physical Examinations

The appropriate physical examination prescribed in Part 29 of the Civil Air Regulations for the original issuance of a pilot certificate shall be accomplished before any practical or theoretical test or other examination will be given, and shall be completed within the 12-month period immediately preceding the giving of such tests or examinations.

Periodic physical examination.—(*a*) A certificated pilot shall not pilot an aircraft in flight unless within the preceding 12 calendar months he has met the physical requirements for original issuance of his certificate by passing an examination given by an authorized medical examiner of the Administrator. (*b*) In lieu of the physical examination conducted by an authorized medical examiner of the Administrator, a certificate from the appropriate officer in charge of flying in the Army, Navy, Marine Corps, or Coast Guard certifying that the applicant is on pilot status solo in such service will be accepted as evidence of the physical fitness required for the issuance of any medical certificate provided for in this Part: *Provided,* That the physical qualifications required for such pilot status are not less than those required by these regulations for the grade of pilot certificate applied for (20.73).

Medical certificate.—A medical certificate issued by an authorized medical examiner of the Administrator or other evidence satisfactory to the Administrator that the pilot has met the appropriate physical requirements prescribed in Part 20 shall be carried by such pilot while piloting aircraft. *Provided, however,* that military personnel assigned to CAA War Training Service for pilot training shall be deemed to have met such requirements during period they are receiving student pilot training (20.730).

Correcting lenses.—A certificated pilot who, at his most recent periodic physical examination, met the physical qualifications for original issuance of his grade of certificate only by the use of correcting lenses shall not pilot aircraft in flight without wearing such correcting lenses, and a statement to that effect shall be endorsed by the medical examiner on his medical certificate (20.731).

Pilot experience report.—At the time of each physical examination the pilot shall furnish to the medical examiner to be forwarded by him to the Administrator a report setting forth the amount and type of his aeronautical experience and such other pertinent data as the Administrator may require, since his last preceding medical examination (20.74).

Waiver of physical standards.—An airman certificate may be issued to an applicant who does not meet the appropriate physical standards if in the opinion of the Administrator his aeronautical experience, ability and judgment compensate for his physical deficiency. A medical certificate issued under these conditions may be limited as to type of operation, type of aircraft or period of reexamination: *Provided,* That the provisions of this section shall not apply to applicants for the original issuance of an airline transport pilot certificate (29.2).

Aircraft Used in Tests

The applicant must furnish a *certificated aircraft* for any flight test involved. Each such aircraft, used in any test for a pilot certificate above the grade of student pilot, must be equipped with dual controls and must accommodate the applicant, the inspector, and parachutes for both. Aircraft having only one elevator and aileron control for two seats, or any arrangement whereby all flight and engine controls cannot be handled in a normal or conventional manner from either seat are not considered as having dual controls for the purpose of flight tests for pilot certificate or ratings. Each such aircraft must have adequate vision for the pilot and check pilot (20.61).

Inspection

The applicant for a pilot certificate or rating must offer full cooperation with respect to any inspection or examination which may be made of such applicant upon proper request by any authorized representative of the Administrator prior or subsequent to the issuance of a pilot certificate or rating (20.62).

Standard of Performance

Every practical and theoretical examination and test must be accomplished to the satisfaction of the Administrator. The passing grade in the subject of examination and test is at least 70 percent. Each flight maneuver will be graded separately. Other examinations will each be graded as a whole (20.63).

Reexamination for Pilot Certificates

The following rules govern application for reexamination for pilot certificates:

An applicant for a private or commercial pilot certificate who has failed to accomplish successfully any prescribed theoretical examination may apply for reexamination at any time after the expiration of 30 days from the date of such failure, or after he has received not less than 5 hours' instruction on each subject of the examination failed from a certificated ground instructor rated for such subject and presents a statement from such instructor showing the amount of instruction given and stating that he deems the applicant qualified to pass the required examination in such subject.

An applicant for a private or commercial pilot certificate who has failed to accomplish successfully any prescribed practical examination or test may apply for reexamination only after he has logged at least 6 additional hours of flight time, including at least 3 hours of dual instruction time with a certificated instructor and his instructor shall have certified in the applicant's log book that he deems such applicant qualified for the certificate sought. Upon meeting these requirements, an applicant for reexamination shall be deemed to have met the 5-hour solo flight time requirement set forth under the heading "Aeronautical experience" in the table on page 42 (20.650).

Reexamination for Special Ratings

An applicant for a special rating who has failed any prescribed theoretical examination for such rating may apply for reexamination at any time after the expiration of 30 days from the date of such failure, or after he has received not less than 5 hours' instruction on each subject of the examination failed from a certificated flight instructor, a certificated ground instructor rated for the subject, or a person qualified to instruct in the theory of instrument flight. The applicant shall verify such instruction by presenting a statement from such instructor or pilot showing the amount of instruction given and stating that he deems the applicant qualified to pass the required examination in such subjects.

An applicant who has failed the flight test for a special rating may apply for reexamination only after he has logged at least 6 additional hours of flight instruction and his instructor shall have certified in the applicant's log book that he deems such applicant qualified to pass the required flight test. Such instruction shall be given by a certificated flight instructor if for a flight instructor rating and by a pilot holding the appropriate aircraft rating and instrument rating if for an instrument rating (20.651).

REVOCATION

No person whose pilot certificate has been revoked may apply for or be issued a pilot certificate of any grade or rating for a period of one year after the revocation, except as the order of revocation may otherwise provide (20.35).

DURATION OF PILOT CERTIFICATES

A pilot certificate shall be of 60 days' duration and, unless the holder is otherwise notified by the Administrator within such period, it shall continue in effect thereafter until otherwise specified by the Board unless suspended or revoked, or until the holder has applied for and has been issued a new certificate of a different grade to pilot the same type of aircraft (20.31).

A pilot certificate currently effective on April 1, 1942, shall continue in effect for a period of 60 days subsequent to the date of its issuance and, unless the holder is otherwise notified by the Administrator within such period, shall continue in effect indefinitely thereafter, unless suspended or revoked or until the holder has applied for and has been issued a new certificate of a different grade to pilot the same type of aircraft: *Provided*, That no limited commercial certificate shall remain effective after May 1, 1942: *Provided, further*, That a pilot certificate under suspension on April 1, 1942, shall, after reinstatement, continue in effect in accordance with the provisions of this section applicable to currently effective pilot certificates (20.310).

Review Questions

1. May a person who does not possess a pilot certificate pilot an aircraft on a civil airway?
2. May a person who does not possess a pilot certificate pilot an aircraft in interstate, overseas, or foreign air commerce if he stays off civil airways?
3. When may a person operate the dual controls of an aircraft without holding a valid pilot certificate?
4. Name the grades of pilot certificates for aircraft other than glider or lighter than air.
5. What are the minimum age requirements for student, private, and commercial pilots?
6. What specific requirements must a student pilot meet before his first solo flight, in addition to the requirements for the student pilot certificate?
7. How many hours of solo flight time are required of an applicant for a commercial pilot certificate?
8. How many hours of solo flight time must trainees in the CAA War Training Service program have before they are eligible for commercial pilot certificates?
9. What is an airman rating record?
10. Name the classes of aircraft by type.
11. Name the engine classes of airplanes.
12. Name the special pilot ratings.
13. How often is a physical examination required after the original issuance of a certificate?
14. What provision regarding medical certification has been made for military personnel assigned to CAA War Training Service for pilot training?
15. If an applicant for a private or commercial certificate fails any prescribed theoretical examination, what should he do?
16. Is it possible for a person whose pilot certificate has been revoked to obtain another pilot certificate?
17. What is the duration of a pilot certificate?

Chapter VI.—AIRCRAFT CERTIFICATION

NECESSITY FOR AIRCRAFT CERTIFICATES

The two kinds of aircraft certificates are **registration** certificate and **airworthiness** certificate.

All aircraft operated in the United States must be registered (have a registration certificate) except aircraft of the national defense forces which are exempted from this requirement provided they are identified in a manner satisfactory to the Administrator, and aircraft of foreign registry which may be granted special authorization by the Administrator to make flights in the navigable air space of the United States.

Except in the cases noted above, it is unlawful for any person to operate or navigate any aircraft eligible for registration if such aircraft is not registered by its **owner.**

It is unlawful for any person to operate in air commerce any civil aircraft for which there is not currently in effect an airworthiness certificate, or in violation of the terms of any such certificate.

"Air commerce," as previously defined, means interstate, overseas, or foreign air commerce or the transportation of mail by aircraft or any operation or navigation of aircraft within the limits of any civil airway or any operation or navigation of aircraft which directly affects, or which may endanger safety in, interstate, overseas, or foreign air commerce (Civil Aeronautics Act of 1938, title V, sec. 501 (a), and title VI, sec. 610 (a) (1).

However, the Civil Aeronautics Board has declared that any operation of aircraft in the air space overlying the United States either directly or indirectly affects or may endanger safety in, interstate, overseas, or foreign air commerce (amendment 135).

Consequently, no flight, other than of a foreign aircraft whose navigation in the United States has been authorized according to law, shall be made or authorized to be made in the United States in civil aircraft unless there is outstanding for such aircraft a valid airworthiness certificate (60.31).

AIRWORTHINESS CERTIFICATE

Application

Application for an airworthiness certificate may be made by the **registered owner** of any aircraft registered as an aircraft of the United States upon the applicable form prescribed and furnished by the Administrator (01.10).

Issuance

Prior to the issuance of an airworthiness certificate, the subject aircraft is inspected by a duly authorized representative of the Administrator to determine whether it is in condition for safe operation and complies with the airworthiness requirements specified in the Civil Air Regulations: *Provided*, That an airworthiness certificate may be issued for an aircraft for which no such certificate has previously been issued and which has been manufactured under a type certificate or under a type and a production certificate if the applicant for such certificate, upon request, presents to a duly authorized representative of the Administrator a Statement of Conformity properly executed by the manufacturer of the aircraft on a form prescribed and furnished by the Administrator, and if the aircraft satisfactorily passes an inspection made to determine whether such aircraft is in condition for safe operation: *Provided further,* That an aircraft manufactured under a *type* certificate only *must* undergo, and an aircraft manufactured under a *type* and a *production* certificate *may* be required to undergo, an inspection to determine whether such aircraft conforms to the type certificate under which it is manufactured (01.11).

Duration

An airworthiness certificate is of 60 days' duration and, unless the holder is otherwise notified by the Administrator within such period, continues in effect indefinitely thereafter, unless suspended, revoked, or canceled, except that it immediately expires:

(1) at the end of a specifically designated period after the date of issuance of the certificate or after the date of the last endorsement thereof, whichever is later, if the holder of such certificate fails to secure within such period an examination or inspection by an authorized inspector for the Administrator or

(2) at any time an authorized inspector of the Administrator shall refuse to endorse such certificate after examination or inspection.

NOTE.—A statement of duration will appear on all airworthiness certificates. The above reference to a "specifically designated period" means the period which will be designated on each airworthiness certificate. Under ordinary circumstances an *airworthiness* certificate will have to be *endorsed each year* (01.13).

Cancellation

An airworthiness certificate may be canceled upon the written request of the registered owner of the aircraft (01.21).

Transferability

An airworthiness certificate and the attached currently effective Aircraft Operation Record, upon transfer of ownership, shall remain with the aircraft for which they were issued (01.14).

REGISTRATION CERTIFICATE

Application

Application for the registration of an aircraft must be made upon the applicable form prescribed and furnished by the Administrator. This application must be accompanied by proper documentary evidence of the applicant's ownership of such aircraft and satisfactory proof that the applicant is a citizen of the United States.

Duration

The registration and certificate issued pursuant thereto shall remain in effect indefinitely unless suspended or revoked. However, such registration and certificate may be canceled by the Administrator at any time within 90 days after issuance and thereafter they shall immediately expire upon the date: (*a*) The aircraft is registered under the laws of any foreign country, (*b*) the registration of the aircraft is canceled at the written request of the owner, (*c*) the aircraft is totally destroyed or scrapped, or (*d*) the ownership of the aircraft is transferred, unless on the date the registered owner transfers ownership of such aircraft he endorses the registration certificate in the manner provided thereon and the purchaser makes application for the registration of the aircraft in his name (501.4).

Invalidation

Any registration of an aircraft by the Administrator becomes null and void if at the time of registration: (*a*) The aircraft was registered under the laws of any foreign country; or (*b*) the person registered as owner was not the true and lawful owner of the aircraft; or (*c*) the person registered as owner was not a citizen of the United States as defined in section 1 (13) of the Civil Aeronautics Act of 1938, as amended, or the interest of such person in the aircraft was created by any transaction not entered into in good faith but for the purpose of avoiding, with or without knowledge of the registered owner, the provision of the Civil Aeronautics Act of 1938, as amended, prohibiting the registration of an aircraft in the name of a person not a citizen of the United States (501.6).

Transferability

A registration certificate is not transferable except that upon the transfer of ownership of an aircraft registered as a civil aircraft of the United States, the registration and certificate issued pursuant thereto may be transferred to the purchaser upon the following conditions:

(1) the purchaser is a citizen of the United States;

(2) on the date the registered owner transfers ownership of such aircraft, he shall endorse the registration certificate in the manner provided thereon and deliver such certificate to the purchaser; and

(3) on the date of transfer, an application for registration of the aircraft in the name of the purchaser, together with all documents required for previously registered aircraft, is mailed to the Administrator (501.3).

AIRCRAFT OPERATION RECORD

An aircraft for which an airworthiness certificate is currently in effect, referred to as a **certificated aircraft,** shall not be operated unless there is attached to such airworthiness certificate the appropriate Aircraft Operation Record prescribed and issued by the Administrator, nor shall such aircraft be operated other than in accordance with the limitations for safe operations prescribed and set forth by the Administrator in such record. An aircraft for which an airworthiness or experimental certificate is in effect on the effective date of this section may be operated without an Aircraft Operation Record until expiration, cancellation, or revocation of any such certificate (01.12).

GENERAL CERTIFICATE RULES

Display

A registration certificate and an airworthiness certificate must be carried at all times in the aircraft for which such certificates have been issued and must be presented upon the request of any duly authorized representative for the Administrator or Board, or any State or municipal official charged with enforcing local laws or regulations involving Federal compliance.

Surrender

Upon cancellation, suspension, revocation, expiration, or invalidation of a registration certificate or an aircraft airworthiness certificate, the owner of the aircraft must, upon request, surrender such certificates to any authorized representative of the Administrator.

IDENTIFICATION MARKS

Necessity for Identification Marks

No aircraft (except a foreign aircraft provided for in section 6 of the Air Commerce Act of 1926, as amended) shall be operated within the United States unless it displays an identification mark assigned thereto by the Administrator: *Provided,* That aircraft of the national defense forces of the United States shall be identified by the agency having jurisdiction over them in a manner satisfactory to the Board.

Assigned Identification Marks

The identification marks assigned by the Administrator are as follows:

NC.—A certificated aircraft which has **fully complied** with the minimum airworthiness requirements specified in the Civil Air Regulations, displays the roman capital letters NC followed by the registration number.

NR.—A certificated aircraft which has not demonstrated compliance with the airworthiness requirements specified in the Civil Air Regulations, but which in the opinion of the Administrator, is in condition for safe operation **for particular activities,** must display the roman capital letters NR followed by the registration number.

NX.—A certificated aircraft which has not demonstrated compliance with the airworthiness requirements specified in the Civil Air Regulations, but which, in the opinion of the Administrator, is in condition for safe operation **for experimental purposes,** must display the roman capital letters NX followed by the registration number.

An uncertificated aircraft must display the registration number only.

A certificated aircraft manufactured in the United States for delivery to a foreign purchaser may display such marks or insignia as the appropriate foreign government designates. Such aircraft may only be operated for the purpose of test flights and demonstration for a limited time in the immediate vicinity of the manufacturer's airport or for the sole purpose of delivery to the foreign purchaser (60.32).

Location and Display of Identification Marks

The identification mark on conventional aircraft must be displayed, in the case of a biplane, on the lower surface of the lower left wing and on the upper surface of the upper right wing, and in the case of a monoplane, on the lower surface of the left wing and the upper surface of the right wing: *Provided,* That if the length of the lower left wing of a biplane is less than one-half the length of the upper left wing, the identification mark must be displayed on the lower surface of the upper left wing as far to the left as possible. The top of the letters and figures must be toward the leading edge. The height must be at least four-fifths of the mean chord but need not exceed 30 inches. The mark must also be located on both sides of the vertical tail surface of all conventional airplanes, of a size as large as a 2-inch margin will permit. On gliders the letters and figures must be displayed in the same manner and place prescribed for conventional airplanes except the minimum height must be 15 inches. On aircraft other than conventional airplanes or gliders or on conventional aircraft where the design or dimensions of the wing prevent the display of the identification mark in the manner prescribed above, the identification mark must be displayed in such manner as may be prescribed by the Administrator (60.320).

Lettering of Identification Marks

The width of the letters and figures (except the figure 1) must be at least two-thirds of their height. The width of each stroke must be at least one-sixth of the height of the letters and figures, which must be of uniform size. The space between such letters and figures must be not less than one-sixth of the height. Such letters and figures must be painted on the aircraft in a solid color and on a clearly contrasting background. Such identification mark must be kept clean and clearly visible. No other design, mark, or symbol which might modify or confuse the assigned mark may be placed on the aircraft except with the approval of a duly authorized inspector of the Administrator (60.321).

OPERATION AND MAINTENANCE OF CERTIFICATED AIRCRAFT

Permission To Operate Aircraft

Neither the owner nor anyone having custody of an aircraft shall permit any person to operate such aircraft unless the owner or the one having custody of the aircraft has ascertained that such person is the holder of an appropriate currently effective pilot certificate by actual examination of the certificate and by requiring such person to identify himself as the person referred to in the certificate.

Recent Experience Requirements

Solo Flight.—A certificated pilot who within the preceding 6 calendar months has not made and logged at least 5 take-offs and 5 landings to a full stop in an aircraft of the type and class proposed to be flown shall pass a flight check in such aircraft before otherwise piloting civil aircraft of that type and class. Such check flight shall be given by a certificated pilot of private grade or higher qualified by having made within the preceding 3 calendar months at least 5 take-offs and 5 landings to a full stop in an aircraft of the same type and class as that of the aircraft proposed to be flown.

Passenger Flight.—A certificated pilot shall not pilot any civil aircraft carrying any other person (other than a certificated pilot of at least private grade or higher, rated for the aircraft operated and possessed of the recent experience required by this section or any member of the crew thereof) unless, within the preceding 3 calendar months, he shall have made and logged at least 5 take-offs and 5 landings to a full stop in an aircraft of the same type and class as that of the aircraft in which any such person is carried: *Provided,* That a pilot while flying in scheduled air transportation shall be governed as to recent experience for passenger flight by the provisions of Part 61.

Instructional Flight.—No flight instructor shall give flying instruction in civil aircraft to any other person unless within the preceding 12 calendar months he shall either

(*a*) while possessed of a valid instructor's rating have given at least 10 hours of flight instruction in aircraft for which he held at the time of giving such instruction a valid aircraft rating, or

(*b*) have passed such practical flight test as the Administrator deems necessary and appropriate to demonstrate continued proficiency for giving flight instruction.

Night Flight.—No person shall take off or land a civil aircraft carrying passengers during the period from one hour after sunset to one hour before sunrise, unless he has made and logged at least 5 take-offs and 5 landings to a full stop during such period within the preceding 3 calendar months.

Instrument Flight.—A certificated pilot who within the preceding 6 calendar months has not flown and logged at least 2 hours of flight time solely by reference to instruments under either actual or properly simulated instrument flight conditions, shall not pilot an aircraft under such conditions until he has flown and logged at least 2 hours of such flight time accompanied by a certificated pilot of at least private grade holding an appropriate type, class, and horsepower rating for the aircraft, and authorized to operate aircraft under instrument conditions.

Aircraft and Engine Log Books

The registered owner of a certificated aircraft is responsible for the maintenance and, upon request, the presentation to a duly authorized representative of the Administrator or Board, of a log book for the aircraft and a log book for each engine installed therein. Such log books must be current, accurate, legible, and permanent records. The aircraft log book must contain a complete operating history of the aircraft which must include, but is not limited to, flight time of the aircraft, reports of periodic or other inspections, minor repairs, and minor alterations of the aircraft structure and propellers. Each engine log book must contain a complete operating history of the aircraft engine to which it pertains, which must include, but is not limited to, the running time of the engine in flight, reports of periodic or other inspections, minor repairs, and minor alterations of the aircraft engine (01.27).

Log book entries may be replaced in the case of scheduled air carrier aircraft, aircraft engines, and propellers, by a suitable system of recording the information required.

Maintenance of Certificated Aircraft

A certificated aircraft must not be operated unless maintained in condition for safe operation (01.24).

Periodic Inspection

A certificated aircraft must not be operated unless, within the **100 hours** of flight time last preceding such operation, such aircraft was given a periodic inspection. Such inspection must be made by a person to whom there has been issued a currently effective and appropriate mechanic certificate, and must be made in accordance with the Periodic Aircraft Inspection Report form prescribed and furnished by the Administrator. The results of such inspection must be entered in the aircraft log book and on the Periodic Aircraft Inspection Report form over the signature and certificate number of the person making the same (01.25).

Other Inspections

In all cases, except inspections following repairs or alterations to certificated aircraft, the **registered owner** is responsible for having such aircraft given a periodic inspection by a person to whom there has been issued a currently effective and appropriate mechanic certificate, within a reasonable time prior to presentation for inspection by a duly authorized representative of the Administrator. In cases of inspections following repairs or alterations of aircraft, such representative may require such inspection of the aircraft as he deems necessary, by a person to whom there has been issued a currently effective and appropriate mechanic certificate (01.26).

CONTACT AND INSTRUMENT FLIGHT EQUIPMENT

Landplanes

Airplanes which are certificated as non-air carrier must have at least the following equipment:

Visual-contact day flying (within 100 miles of a fixed base)

(*a*) One airspeed indicator.
(*b*) One altimeter.
(*c*) A tachometer for each engine.
(*d*) An oil-pressure gage when an oil-pressure system is employed.
(*e*) A water thermometer for each water-cooled engine.
(*f*) An oil thermometer for each air-cooled engine.
(*g*) A manifold-pressure gage, or equivalent, for each altitude engine.
(*h*) A fuel quantity gage.
(*i*) Certificated safety belts for all passengers and members of the crew.
(*j*) A portable fire extinguisher, which extinguisher shall be of an approved type which must have a minimum capacity, if carbon tetrachloride, of one quart, or, if carbon dioxide, of 2 pounds, or, if other, of equivalent effectiveness; except that any extinguisher of not less than half the above capacity may be used in an airplane equipped with an engine whose maximum rating is 40 horsepower or less.
(*k*) Landing gear position indicator for retractable main landing gear.
(*l*) A device for measuring or indicating the amount of oil in the tanks.
(*m*) A first-aid kit.
(*n*) A log book for the airplane and one for each engine.
(*o*) Rigging information for airplanes with wire-braced wings, either in the form of a sketch or listed data, which must include sufficient information to permit proper rigging (04.510).

Visual-contact day flying (unlimited distance)

Airplanes of this category must have the equipment specified in the section above and, in addition, there must be installed:
(*a*) A magnetic compass (04.511).

Visual-contact night flying

Airplanes of this category shall have the equipment specified above and, in addition, there shall be installed:

(*a*) A set of certificated standard forward position lights in combination with a certificated tail light.

(*b*) Two electric landing lights if the aircraft is **operated for hire:** *Provided, however,* That only one such landing light shall be required for any airplane certificated for a weight of less than 1,500 pounds.

(*c*) Certificated landing flares as follows, if the aircraft is **operated for hire** beyond an area within a circle with a radius of **3 miles** drawn from the center of the airport of take-off:

Airplanes of 3,500 pounds maximum authorized weight or less—five Class 3 flares or three Class 2 flares.

Airplanes of between 3,500 pounds and 5,000 pounds maximum authorized weight—four Class 2 flares.

Airplanes of 5,000 pounds maximum authorized weight or more—two Class 1 flares or three Class 2 flares and one Class 1 flare.

If desired, airplanes of less than 5,000 pounds maximum authorized weight may carry the flare equipment specified for heavier airplanes.

(*d*) A storage battery suitable as a source of energy supply for such lights and radio as are installed.

(*e*) Radio equipment, if the aircraft is operated in a **control zone,** as follows: A radio range and weather broadcast receiver operating within the frequency range of 200 to 400 kilocycles. Under normal atmospheric conditions this receiver must be capable of receiving with a range of 100 miles intelligence emanated from a radio range or weather broadcast station the equivalent of an SBRA installation.

(*f*) A set of spare fuses (04.512).

Instrument day flying

Airplanes of this category shall have the equipment specified for visual-contact day flying (unlimited distance) and, in addition, there shall be installed:

(*a*) Radio equipment as specified in visual-contact night flying, whether the aircraft is operated for hire or not, and, in addition, a radio transmitter operated on 3105 kilocycles with a power output sufficient to establish communication at a distance of at least 100 miles under normal atmospheric conditions. Additional frequencies may be employed subject to approval of the Federal Communications Commission.

(*b*) A gyroscopic rate-of-turn indicator.

(*c*) A bank indicator. (Instruments (*b*) and (*c*) may be combined in one instrument if desired.)

(*d*) A sensitive altimeter which shall be adjustable for changes in barometric pressure and compensated for changes in temperature.

(*e*) A clock with a sweep-second hand.

(*f*) A storage battery suitable as a source of energy supply for the radio equipment installed.

(*g*) A generator.

(*h*) A set of spare fuses.

(*i*) A rate-of-climb indicator (04.513).

Instrument night flying

Airplanes of this category shall have the equipment specified for visual-contact night flying and instrument day flying combined. The storage battery shall be suitable as a source of energy supply for both the radio equipment and the lights (04.514).

Seaplanes and Amphibians

The equipment requirements for non-air carrier seaplanes and amphibians shall be the same as specified for landplanes except that seaplanes and amphibians shall not be certificated for operation over water out of sight of land unless they have at least a magnetic compass, and except that all certificated seaplanes and amphibians shall also have an approved life preserver or flotation device for each person for which there is a seat, and except that all seaplanes and amphibians certificated for night operation shall also have a white anchor light (04.515).

Review Questions

1. What are the two kinds of aircraft certificates?
2. May an aircraft be legally flown in the United States without a registration certificate?
3. May an aircraft be legally flown in the United States without an airworthiness certificate? When and under what conditions?
4. Under what conditions will a registration certificate be issued?
5. In case of transfer of ownership of an aircraft, what happens to the registration certificate?
6. Under what conditions is an aircraft eligible for an airworthiness certificate?
7. What is the usual endorsement period for an airworthiness certificate?
8. In case of transfer of ownership of an aircraft, what happens to the airworthiness certificate?

9. What is a "certificated aircraft"?
10. What is an aircraft operation record? What information does it contain?
11. Why should a certificated pilot read the aircraft operation record before flying a strange aircraft?
12. Name the three identification marks used for identification of certificated aircraft and give the meaning of each.
13. If an aircraft displays a registration number only, what does that signify?
14. Before an owner may allow anyone to operate his aircraft, what procedure must he follow?
15. When is a flight check given to a certificated pilot desiring to make a solo flight?
16. What is the purpose of aircraft and engine log books?
17. When is a periodic inspection required and by whom may it be made?
18. Who is responsible for seeing that an aircraft receives a periodic inspection at such times as is required?
19. Check an aircraft to which you have access and note whether it has all the equipment required for a certificated non-air carrier landplane making visual-contact day flights (unlimited distance), and make note of any additional equipment.
20. What equipment in addition to that for landplanes making visual-contact day flights (unlimited distance) is required for night flying?
21. What equipment is required for a certificated landplane making an instrument flight during the day? During the night?
22. When are landing flares required in an aircraft making contact flight?
23. When is radio equipment required in an aircraft making contact flight?

Chapter VII.—EMERGENCY AND MISCELLANEOUS REGULATIONS

EMERGENCY REGULATIONS

In addition to the rules covered in the preceding chapters of this book, pilots will be governed by certain emergency regulations which have been in effect since February 15, 1942. All current additions to or changes in these emergency regulations appear in the "Weekly Notice to Airmen."

Each pilot should familiarize himself with the following general regulations pertaining to flights during the emergency period.

Designated Landing Areas

Except upon the prior approval of the Administrator, or his authorized representative, no person shall

(1) *take-off* any aircraft from a place other than a designated landing area, or

(2) *land* any aircraft at any place other than a designated landing area except where such landing is caused by unforeseeable circumstances beyond the control of such person, in which event the pilot of the aircraft shall make a report to the Administrator, or his designee, at the landing area to which he was cleared as soon as possible, and in no case more than 24 hours after such landing, setting forth fully the reasons therefor.

Take-off Procedure

No person shall take off any aircraft from a designated landing area unless immediately prior to such take-off

(1) He shall have **submitted** to the Administrator, or a person designated by him, at such landing area sufficient **information** to **identify** adequately the pilot, occupants, and the aircraft, and to **describe** the route, duration, nature, and purpose of proposed flight: *Provided,* That a pilot may conduct an **entire day** of **local operation** of a particular aircraft on **one clearance** if he keeps an accurate record of all persons carried in this aircraft throughout the day and files this record with the Registrar and Clearance Officer when filing his arrival notice at the end of the day's flight operation.

(2) He shall have **secured** a **clearance** for take-off issued in accordance with this section: *Provided,* No clearance shall be granted unless—

(*a*) the applicant for clearance demonstrates to the Administrator, or person designated by him, that the applicant is the holder of a currently effective pilot certificate and presents the identification card required;

(*b*) the route proposed to be flown by the applicant permits compliance with the section concerning vital defense areas and zones of military operation;

(*c*) the aircraft proposed to be flown is equipped with functioning two-way radio if the flight is other than a local flight; and

(*d*) the issuance of such clearance is consistant with instructions issued by the Civil Aeronautics Administration: *Provided,* That with special permission of the Administrator, or person designated by him for this purpose, a flight may be cleared to operate in daylight in accordance with daylight contact flight rules beyond the local flying area of the landing area from which take-off is made notwithstanding that the aircraft flown is not equipped with functioning two-way radio. No clearance under this section shall be deemed to authorize the violation of any regulation.

(3) *If* the flight be *to another landing area and requires operation* into or within a *vital defense area* or a *zone of military operations*, he shall have *transmitted* to such landing area, through the person granting clearance, a *message* by telephone or telegraph *identifying* the *aircraft* to be flown and *stating* the estimated *time* of *arrival*. *Provided*, That this requirement need not be met if a flight plan has been filed with Airway Traffic Control for the flight.

(4) He shall have *familiarized* himself with all available *current flight information* relating to the area proposed to be traversed on his flight.

Landing Procedure

Immediately after landing an aircraft upon a designated landing area, the **pilot shall submit** to the Administrator, or his designee at such landing area, a **copy** of his **clearance** and such other information as may be required: *Provided*, That if a series of local flights is being made in accordance with the outlined provisions, such information need be submitted only after the final landing at the end of the day's flight operation.

After a **flight** from another designated landing area which **involved operation into or within** a **vital defense area** or **zone of military operation,** the pilot shall **transmit** to the landing area from which he was cleared for the flight, through the Administrator's designee at the landing area on which the landing was made, a **message** by telephone or telegraph **identifying** the **aircraft** flown and **stating** the **time** of arrival: *Provided*, That this requirement need not be met if a flight plan has been filed for the flight with Airway Traffic Control.

Operation of Aircraft

No person shall operate an aircraft

(1) otherwise than in accordance with the description of the flight submitted to the Administrator or his designee at the landing area from which take-off was made, except in case of emergency in which event the pilot of the aircraft shall make a report to the Administrator, or his designee, at the landing area of departure or arrival as soon as possible after such deviation, describing the deviation and setting forth fully the reasons;

(2) into or within a vital defense area or zone of military operations otherwise than in accordance with the conditions specified for such operation.

No person shall leave an aircraft unattended under circumstances which would permit its operation by an unauthorized person without making the aircraft incapable of operation in a manner consistent with any instructions issued by the Administrator for this purpose.

Basing of Aircraft

No person shall base an aircraft at any place within the United States other than a designated landing area without first obtaining specific permission from the Administrator issued upon such conditions as he deems necessary.

(1) Immediately upon basing aircraft as above, the owner shall submit to the Administrator or his designee at such landing area sufficient information to identify the aircraft, its owner, and the last previous base.

(2) If **aircraft** is to be **absent from** its **base** at any time for **more than 72 hours,** the owner shall submit to the Administrator's designee at such base

such information as may be necessary to permit him to locate the aircraft promptly in case of necessity.

(3) Prior to changing the base, the owner of an aircraft shall notify the Administrator, or his designee, at his present base, of his intention, stating the name and location of the landing area to which the aircraft is to be transferred.

Discontinuance of Scheduled Broadcasts

All scheduled broadcasts within the continental limits of the United States have been discontinued; however notices to airmen concerning radio communication facilities will continue to be broadcast immediately upon receipt and one time only. Simultaneously, Aircraft Landing Code, which is a code system for the communication of airway landing weather by radio to pilots in flight, will become effective.

Dissemination of Meteorological Information

The following procedure shall be observed by pilots in utilizing radio in aircraft for transmitting flight plans or requesting weather information:

(1) Flight plans may be transmitted by radio when necessary for proper operation, except that all flight plans so transmitted shall be in standard instrument form. In submitting an instrument flight plan it will be assumed that the pilot is qualified to conduct the flight under instrument conditions unless he indicates otherwise. Pilot shall not use the terms "on top," "CFR," "CTC/Altitude" and "Altitude/CFR" when transmitting flight plans by radio. The transmission of flight plans containing the above terms should be accomplished in person or by interphone for information of the airway traffic control center concerned. Change of altitude, position report, etc., can be reported in accordance with past practices except that no reference shall be made to weather conditions or the above terms.

(2) Since the pilot will obtain all weather information necessary from the Weather Bureau or Civil Aeronautics Administration communication station where no Weather Bureau is located prior to departure, only limited weather information will be necessary while in flight. The pilot while in flight may request weather information from airport traffic control towers of Civil Aeronautics Administration communication stations. If any element of the coded weather report cannot be understood by the pilot, he may request that element by stating the item he desires, such as "Say again visibility," etc. On receipt of the coded weather information from ground stations, the pilot shall not repeat back the coded information but merely acknowledge receipt of the message.

(3) A pilot is permitted to obtain only two coded weather reports, one local, one distant, when contacting any one radio station along the route of flight. Pilots should limit their requests for weather reports and obtain only those essential for the safe completion of the flight. Since weather transmissions are made only on low power (radius 15 miles), it is necessary for the pilot desiring a report for a distant location to radio ahead in sufficient time to permit communications personnel to have the desired report coded when pilot reports over or within range of the low power transmitter since only the local report will be coded and available for immediate transmission.

(4) The pilot in no case shall transmit weather information over his radio in plain language except in extreme emergency conditions where safety of life or property is endangered.

(5) Altimeters shall continue to be set to the setting of the nearest station reporting official altimeter settings along the route of flight. Current altimeter

setting should be utilized. The pilot prior to departure should obtain and record altimeter settings for reference while in flight. In addition, altimeter settings can be obtained while in flight in code as indicated in item 3.

(6) Ground stations are required to transmit weather information in plain language to the pilot whenever extreme emergency conditions occur where safety of life or property is endangered.

(7) Immediately on completion of the flight, the pilot shall turn in the aircraft landing code forms to the "flight clearance officer," or military or company operations office as applicable to the pilot concerned, or when not possible destroy by burning. The contents of code received by the pilot shall be kept strictly confidential. Instructions contained on code Form WB7 have been modified by the Weather Bureau to conform with the above.

(8) In instances where change of altitude is required by alternate instruction received from an airway traffic control center or a change in approved flight plan is necessary to continue flight in accordance with contact flight rules, pilot shall make such change in accordance with past practices. However, reason for change shall not be reported as this would reveal information as to weather conditions.

Blackout of Air Navigation Aids

As a defense measure all radio aids, rotating beacons, and other lighting facilities in the entire country, **but primarily on both coasts,** are subject to momentary or prolonged periods of complete shutdown without advance notice, both day and night. Exercise extreme caution.

Obstructed Airports

A number of fields, primarily along the west coast, which have not been certified as Designated Landing Areas have had their landing areas and runways obstructed by various methods. In addition, a number of the Designated Landing Areas in the same areas may be obstructed likewise at any time, often without prior warning, but especially during the hours of darkness. These obstructions are so placed that none of the fields is available for landing.

Prohibition of Flight over Army and Navy Installations

Fliers are warned to avoid flight over any Army or Navy field, fort, camp, or other installation, or over any ammunition depot, powder or ordnance plant, etc. Planes approaching these areas may be fired upon without notice. Typical warnings received by telegraph follow:

> ". . . any planes flying over Portsmouth, N. H., will be considered enemy planes and will be fired upon."
>
> ". . . all aircraft to avoid the Parker Dam, Ariz., area. If aircraft approach this area, they will be fired upon."
>
> ". . . all planes flying at low altitude over Fort Ord, Calif., will be fired upon."
>
> ". . . all aircraft approaching field (Morrison Field, West Palm Beach, Fla.), contact control tower 20 minutes out on 3105, 4495, 4595 kilocycles. Any airplane failing to do so will be considered hostile."

Pilots should exercise a high degree of discretion in the planning and execution of cross-country flights.

MISCELLANEOUS REGULATIONS

Passenger Baggage Restrictions

No pilot shall operate aircraft, except in scheduled air transportation, carrying passengers' baggage or cargo unless

(1) he or his agent examines every item of such baggage or cargo and loads same, with no intervening possession by any other person;

(2) he places all cameras of passengers in closed compartments or space in aircraft completely inaccessible to them during flight. Pilots shall permit search of their aircraft upon demand by any representative of the Army, Navy, Civil Aeronautics Administration, Civil Aeronautics Board or by civil police (60.349).

Towing by Aircraft

The towing of aircraft by other aircraft or the towing of any device or object by aircraft is prohibited, unless permission has been granted by the Administrator: *Provided, however,* such restriction shall not apply to military aircraft previously authorized by the appropriate governmental agency to make such flights in the public interest (60.346).

Dropping Objects or Things

No object or thing, other than fine sand, fine (No. 7 or smaller) lead shot, fuel, or water (all unconfined), shall be dropped or released from an aircraft in flight by any person on board the aircraft, unless permission has been granted by the Administrator: *Provided, however,* such restriction shall not apply to military aircraft previously authorized by the appropriate governmental agency to make such flights in the public interest. The pilot or person in charge of the aircraft shall be responsible for the observance of this rule by all persons in the aircraft (60.347).

Aircraft on Water

Seaplanes on the water shall navigate according to the laws and regulations of the United States governing the navigation and operation of watercraft, except as otherwise provided in these regulations (60.92).

Transportation of Explosives

No person shall operate a civil aircraft in flight carrying explosives. However, explosives **do not include:**

(1) the aircraft's signaling or safety equipment (such as a Very pistol or landing flares) or

(2) small arms ammunition in the possession of

  (*a*) a member of the flight crew,

  (*b*) a member of the armed forces of the United States or any of its allies,

  (*c*) an official, employee or officer of the United States, a State, Territory or Possession, or political subdivision thereof, who is lawfully carrying arms on official duty.

This rule shall not apply if the Administrator finds a deviation necessary for the successful prosecution of the war and has issued a certificate of waiver therefor.

Review Questions

1. What procedure (emergency) must a pilot follow before he may take-off?
2. Why is this procedure necessary?
3. Upon completion of a flight is it necessary for a pilot to file an arrival notice with the clearance officer?
4. What should a pilot do if he finds that his passenger has a camera?
5. When is it permissible for one aircraft to tow another aircraft?
6. What is the regulation regarding dropping of objects or things from an aircraft?
7. May a CAA War Training Service trainee operate an aircraft in flight carrying a rifle?

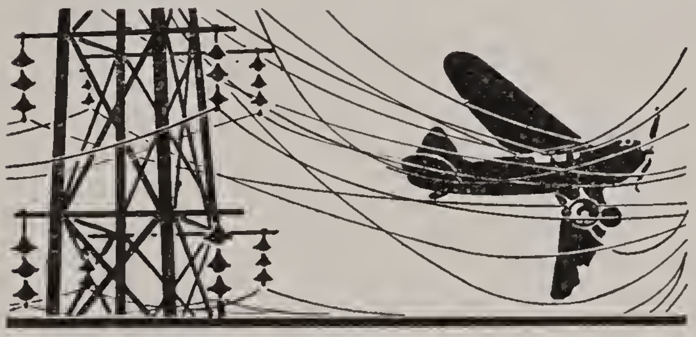
Chapter VIII.—ENFORCEMENT

This book has been compiled on the assumption that pilots will cooperate fully in observance of the regulations because of their relationship to safe flying. The Civil Aeronautics Act of 1938 provides for the enforcement of these regulations and prescribes penalties for violations.

REPORT OF VIOLATIONS

The Civil Aeronautics Board investigates all accidents and violations of the civil air regulations and reports its findings. As a result of these findings, the Board imposes penalties on the violators. The official actions or orders of the Board describing the various penalties are published in the Civil Aeronautics Journal. A few accident reports illustrating typical violations and giving the subsequent penalties are quoted in the following:

Flying Below 500 Feet



"------------ received minor injuries and his passenger, ------------, was seriously injured in an accident which occurred on June 3, 1942, about ------ p. m., approximately ------ miles east of ------------, Illinois. ------------ held a private pilot certificate with a rating to fly single-engine landplanes of from 0–80 hp. He had accumulated a total of approximately 42 hours of flight time, of which about 25 hours were solo. The aircraft, a Taylorcraft BL–65, NC --------, owned by ------------, was extensively damaged.

"At ------ p. m., ------------ took off with his passenger in a rented airplane from the Municipal Airport, ------------, Illinois, and flew to the vicinity of ------------, Illinois. After circling ------------ at an altitude of about 1,000 feet, the pilot throttled his engine and descended to 500 feet. After making another circle under power he again throttled the engine. The pilot stated that when power was applied the second time the engine sputtered and he selected a field for a precautionary landing. During the approach, the landing gear struck and broke two wires of an electric power line about 20 feet above the ground. The airplane crashed in a freshly plowed field approximately 125 feet beyond the power line, bounced, and came to rest 25 feet ahead on the bottom of the fuselage.

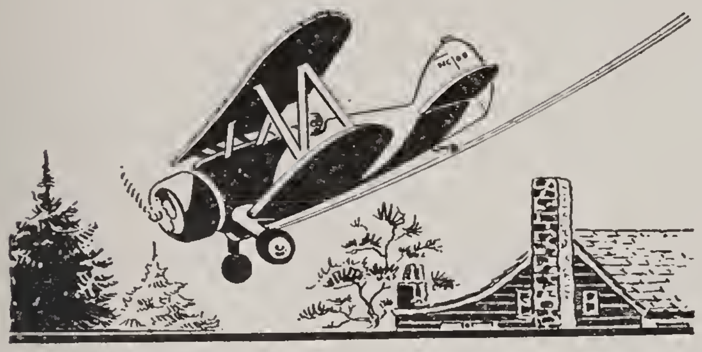
"Evidence revealed that the pilot was cleared from the airport at -------- to -------- and return. He flew several miles beyond ------------ to the vicinity of ------------ and was circling over the farm territory where his family and friends lived. ------------ stated that while he was flying at 500 feet, he throttled down to get to a lower altitude.

"There was no evidence of failure of the aircraft structure, and there was sufficient fuel in the tanks. The cause of the engine's sputtering was not determined. It was started and found to be in operative condition after the accident.

"*Probable cause:* Failure of the pilot to avoid power line during a precautionary landing. *Contributing factor:* Action of pilot in flying at a dangerously low altitude.

"*Order No.* ------ Suspended for 6 months private pilot certificate No. -------- held by ------------ for piloting an aircraft at an altitude of less than 500 feet above the ground and other violations of the Civil Air Regulations."

Low Acrobatics



"Pilot ----------- received minor injuries and his passenger, ----------- was seriously injured in an accident which occurred about ------ miles east of ------------, Pennsylvania, on October 9, 1942, at approximately ------ p. m. ---------- held a private pilot certificate with a Class 2S land rating and had flown around 260 hours. The aircraft, a Piper J4A, NC --------, owned by the pilot and ------------, was extensively damaged.

"------------ obtained clearance for a local pleasure flight and, accompanied by ------------, took off from the ------------ airport at approximately ------ p. m. The plane was next observed flying low over ----------- and in the vicinity of the passenger's home, where ------------ executed a wing-over. During recovery from this maneuver, the left wing struck a tree about 50 feet above the ground. The wing tip sheared off and remained in the tree, while the plane swerved to the left and struck the ground on the left wheel, causing that side of the landing gear to collapse. The airplane then ground-looped to the left and went over on its back.

"------------ stated that he had indulged in several glasses of beer while waiting for ------------, which may account for his trying to show off his flying ability to his friend. In attempting a wing-over at a very low altitude over a wooded area, he misjudged his altitude and struck a tree.

"The weather was suitable for flying and, according to the pilot, had no bearing on the accident.

"*Probable cause:* Failure to complete an acrobatic maneuver executed at a dangerously low altitude over a wooded area. *Contributing factor:* Reckless flying.

"*Order No.* ------ Revoked private pilot certificate held by ----------- for certain violations of the Civil Air Regulations."

Carrying Passenger

"Pilot ---------- and his passenger, ----------, were seriously injured in an accident which occurred approximately ---- miles southeast of --------, Utah, on July 8, 1942, at about ---- a. m. ---------- held a private pilot certificate and was rated to fly single-engine landplanes of 80 hp or less. He had accumulated approximately 100 hours of flying time. ---------- (the passenger) was not certificated as an airman. The aircraft, a Piper J3L–65, NC --------, owned by ---------- and ----------, received major damage.

"---------- obtained clearance for a local pleasure flight from the-------- airport, ----------, Utah, and took off with his passenger at ---- a. m. He flew to the vicinity of his home, where he circled over an orchard to attract his father's attention. During this circling the aircraft was gradually losing altitude and when it had descended to an altitude of about 200 feet, the pilot apparently lost control. Before he could regain control, the aircraft struck the tops of the fruit trees, clipping them for a distance of approximately 80 feet, and then struck the ground. It came to a stop about 30 feet from the point of first impact with the ground.

"The accident occurred approximately 30 miles from the point of take-off and beyond the boundaries of the area described in the flight-clearance.

"*Probable cause:* Failure of the pilot to maintain control of the aircraft while flying recklessly at a low altitude.

"*Order No.* ----. Suspended for 6 months private pilot certificate No.---- held by ---------- for piloting an aircraft carrying a passenger with the dual controls fully functioning when neither he nor the passenger was qualified for such operation and other violations of the Civil Air Regulations."

RESPONSIBILITY FOR INDIRECT VIOLATIONS

From the April 15, 1943, Civil Aeronautics Journal is quoted the following information on responsibility for indirect violations:

"CAA Safety Regulation field men have been instructed to report not only those charged with direct violations of the Civil Air Regulations, but those who, through active participation, carelessness, or neglect of duty or safety responsibilities, are indirectly responsible for violations or resulting accidents.

"Emphasis has always been placed upon fully reporting the violation committed and upon exact definition of the responsibility of the violator. Instruction No. 137, sent out in March over the signature of the Director of Safety Regulation, expresses the conviction that many violations and accidents can be prevented through the proper cooperation of aircraft owners, operators, instructors, airport managers, and other aviation personnel.

"The official instruction stated, 'The relation of every person involved in a violation should be clearly set forth in the violation report and a recommendation submitted for action against them for their part even though there is no section of the regulations covering the particular phase of their involvement.' "

MOST FREQUENT VIOLATIONS

There appeared in the May 15, 1943, Civil Aeronautical Journal an article which contained in part the following facts on violations:

"The most frequent violations of the Civil Air Regulations include the following:

CAR 60.3503—Flying below 500 feet.
CAR 60.701 (b)—Low acrobatics, less than 1,500 feet.
CAR 60.71—Acrobatics while carrying passengers for hire.
CAR 60.72—Acrobatics without parachutes.
CAR 20.720—Student carrying other than certificated instructor.

"These air traffic rules are fundamental to safety in flight and are based upon complete analyses and studies of past and present flying experience. The minimum safe altitudes specified for flight are intended to prohibit unnecessary low acrobatics and low flying.

"Low flying is admittedly difficult to control, and persistent effort is required to curtail it. The immediate problem is to prevent pilots from becoming victims of their own folly. The fact that one out of every five serious or fatal accidents resulted from low flying in 1942 should be conclusive proof that the altitude requirements of the Civil Air Regulations are to be strictly complied with and should not be intentionally violated."

ACCIDENTS

Report and Notification of Accidents

A written report must be made without delay to the Civil Aeronautics Board at its nearest branch office of every accident involving a civil aircraft which occurs within the United States and every accident involving a certificated aircraft of the United States, without regard to where it occurs. Such report must be made upon an accident report form furnished by the Board. In addition, the Board, or the Administrator of Civil Aeronautics, must be notified immediately in person or by cable, telegraph, telephone, or radio, of the occurrence of any air carrier accident, or accident resulting in serious or fatal injury to any person, or accident known or believed to have resulted from a structural failure in flight. This requirement of immediate notification applies to every such accident involving civil aircraft which occurs within the United States and every such accident involving air carrier aircraft without regard to where it occurs. The pilot in command of a nonair carrier aircraft involved in the accident must make the report and notification of the accident as required by this section unless he is incapacitated, in which event the operator of the aircraft must make such report and notification. The operator of an air carrier aircraft involved in an accident must make such report and notification.

Removal, Release, and Preservation of Aircraft

Removal.—No aircraft or part thereof, involved in an air carrier accident or in an accident resulting in serious or fatal injury to any person, or accident known or believed to have resulted from structural failure in flight shall be moved or disturbed, except

(1) when necessary for giving assistance to persons injured or trapped in the wreckage;

(2) when necessary in the interest of public safety;

(3) when specific permission shall have been granted by an authorized representative of the Civil Aeronautics Board or of the Administrator of Civil Aeronautics; or

(4) when prompt movement of the aircraft is necessary to protect it from further serious damage and it is impossible to secure immediate communication with any person authorized in (3) to direct the removal.

Any movement of the aircraft or any part thereof shall be so accomplished as to entail the minimum possible disturbance of the material concerned. Prior to such movement, a record of the original position and condition of the wreckage (as complete and accurate as possible under the circumstances) shall be made unless the danger to public safety is such as to permit of no delay whatever, or unless an authorized representative of the Civil Aeronautics Board has directed otherwise.

The requirements of this section shall be applicable with respect to all accidents as described above which occur within the United States and with respect to all air carrier accidents without regard to where they occur.

Release.—No aircraft or part thereof, involved in an air carrier accident or in an accident resulting in serious or fatal injury to any person, or accident known or believed to have resulted from structural failure in flight, shall be released for repair, salvage, disposal, or any other purpose except upon specific permission granted by an authorized representative of the Civil Aeronautics Board.

Preservation.—An aircraft, aircraft engine, propeller or appliance, or any part or parts thereof, involved in an accident, shall be preserved and removed to such place or places as directed by the Civil Aeronautics Board or any authorized representative thereof for purposes of safekeeping, inspection, testing, or any other purpose consistent with the powers and duties granted the Civil Aeronautics Board under section 702 (a) of the Civil Aeronautics Act of 1938, as amended. However, the wreckage of an aircraft involved in a type of accident other than the categories described above need not be preserved unless specifically directed by the Civil Aeronautics Board or an authorized representative thereof.

Review Questions

1. How is compliance with the Civil Air Regulations enforced?
2. What means does the Civil Aeronautics Board take to inform the aviation public of its action regarding violations?
3. If a pilot is indirectly responsible for an accident, can any action be taken against him?
4. What Civil Air Regulations are most frequently violated?
5. Who makes the report of an accident to the Board?
6. Do minor accidents involving certificated aircraft have to be reported to the Board?

GLOSSARY

Air commerce means interstate, overseas, or foreign air commerce, or the transportation of mail by aircraft, or any operation or navigation of aircraft within the limits of any civil airway, or any operation or navigation of aircraft which directly affects, or which may endanger safety in, interstate, overseas, or foreign air commerce.

Air speed means the speed of an aircraft relative to the air.

Alternate airport means an airport specified in a flight plan to which the pilot plans to proceed in case he is not able to effect a landing at his intended destination.

Approved flight plan is a plan of flight, containing information which has been approved solely with respect to known air traffic conditions by an airway traffic control center of the Administrator.

Ceiling is the distance from the cloud base to the ground.

Ceiling unlimited—A ceiling is considered unlimited when clouds cover less than one-half of the sky or when the base of the clouds is more than 9,750 feet above the point of observation.

Certificated aircraft means any aircraft for which an airworthiness certificate has been issued, and is currently in effect.

Citizen of the United States means (*a*) an individual who is a citizen of the United States or of one of its possessions, or (*b*) a partnership of which each member is such an individual, or (*c*) a corporation or association created or organized under the laws of the United States or of any State, Territory, or possession of the United States, of which the president and two-thirds or more of the board of directors and other managing officers thereof are such individuals and in which at least 75 percent of the voting interest is owned or controlled by persons who are citizens of the United States or of one of its possessions (Civil Aeronautics Act of 1938, title I, sec. 1 (13).

Civil aircraft means any aircraft other than a public aircraft (Civil Aeronautics Act of 1938, title I, sec. 1 (14).

Civil airway means a path through the navigable air space of the United States, identified by an area on the surface of the earth, designated or approved by the Administrator as suitable for interstate, overseas, or foreign air commerce.

Contact flight is flight of aircraft in which the attitude of the aircraft and its flight path can at all times be controlled by visual reference to the ground or water (60.130).

A control zone is the air space above that area on the surface of the earth within 3 miles of the center of a control airport, and within one-half mile of a line extending from the center of such airport to the radio range station established for the purpose of directing air traffic to such airport.

Cruising altitude is the flight altitude, measured in feet above sea level, proposed for that part of a flight from point to point during which a constant altitude will be maintained.

A designated landing area is a landing area designated by the Administrator for the landing and take-off of aircraft during the period of national emergency.

Ground speed means the horizontal component of the velocity of an aircraft relative to the ground.

Instrument flight is flight of aircraft in which visual reference is not continuously available and the attitude of the aircraft and its flight path can be controlled in part or in whole by reference to instruments only (60.131).

Interstate, Overseas, and Foreign air commerce, respectively, mean the carriage by aircraft of persons or property for compensation or hire, or the carriage of mail by aircraft, or the operation or navigation of aircraft in the conduct or furtherance of a business or vocation, in commerce between, respectively, (*a*) a place in any State of the United States or the District of Columbia and a place in any other State of the United States or the District of Columbia; or between places in the same State of the United States through the air space over any place outside thereof; or between places in the same Territory or possession (except the Philippine Islands) of the United States, or the District of Columbia; (*b*) a place in any State of the United States or the District of Columbia and any place in a Territory or possession of the United States; or between a place in a Territory or possession of the United States and a place in any other Territory or possession of the United States; and (*c*) a place in the United States and any place outside thereof, whether such commerce moves wholly by aircraft or partly by aircraft and partly by other forms of transportation. (Civil Aeronautics Act of 1938, title I, sec. 1 (20).

A local flying area is an area adjacent to a designated landing area, including any channel leading thereto, which has been set aside by the Administrator, or his authorized representative, for local flying, and a "local flight" is a flight wholly within such area.

Navigable air space means the air space above the minimum altitudes of flight prescribed by regulations issued under the Civil Aeronautics Act.

Over-the-top flight is flight of aircraft made above an overcast, usually a cloud formation.

Production certificate means a document issued by the Administrator to a manufacturer of aircraft or certain components thereof (see CAR parts 13, 14, 15, and 16), for which a type certificate has been granted, certifying that said manufacturer has complied with the requirements of the Civil Air Regulations for the production of aircraft or components thereof in quantities of an exact similarity of type, structure, materials, assembly, and workmanship with the specifications, descriptions, and drawings forming the basis for said type certificate.

Public aircraft means an aircraft used exclusively in the service of any government or of any political subdivision thereof, including the government of any State, Territory, or possession of the United States, or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes (Civil Aeronautics Act of 1938, title I, sec. 1 (30).

A radio fix is a geographical location designated by the Administrator on a civil airway above which the position of an aircraft in flight can be accurately determined by means of radio only (such as a cone of silence marker, Z-type marker, fan-type marker, or intersection of radio range on-course signals).

Type certificate means a document issued by the Administrator to a manufacturer or designer of aircraft or certain components thereof (see CAR parts 13, 14, 15, and 16), certifying that the type of aircraft or component, as represented by authenticated data in the form of specifications, descriptions, and drawings on file in the office of the Administrator, has been found to be suitable as a basis for the manufacture of airworthy aircraft or components constructed in accordance with such data.

United States means the several States, the District of Columbia, and the several Territories and possessions of the United States, including the territorial waters and the overlying air space thereof. (Civil Aeronautics Act of 1938, title I, sec. 1 (31).

Visibility is the greatest distance toward the horizon at which conspicuous objects can be seen and identified.

A vital defense area is an area set aside by the Secretary of War, or the Administrator upon the request or approval of the Secretary of War, within which the operation of aircraft is prohibited or is authorized only subject to prescribed conditions.

A zone of military operations is an area designated as such by the Secretary of War, or the Administrator upon the request or with the approval of the Secretary of War.

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